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AUTHOR Moore, Cathy
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ABSTRACT

This report describes library applications of electronic bulletin board systems (BBS), i.e., telecommunications software designed to receive incoming calls from other computer systems. It begins by explaining the basics of a BBS; describing a typical configuration, i.e., a microcomputer and a modem connected to standard phone line bulletin board software; and providing a step-by-step example of an exchange of information using a BBS. The advantages of sending information via a BBS rather than over telefacsimile are then discussed, together with the differences between a BBS and an electronic mail system. Special features of the BBS are described, including public announcements stored in text files, help screens, expert and novice modes, security features, conferences, and message threading. The advantages of a multitasking program are discussed, and useful applications of a BBS in a library are suggested, including interlibrary loans, answering reference questions, and providing public bulletin boards to announce library activities or to attract professionals to the library with current information about microcomputers. Specific instructions for setting up a BBS are followed by some advice on making use of the system once it is set up. Annotated listings of BBS software programs, microcomputer-based electronic mail programs, and programs that create interlibrary loan requests for transmission are included, as well as a glossary of terms and a list of suggested readings. (SD)

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Bulletin Boards for Libraries

by
Cathy Moore

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Bulletin Boards for Libraries

How bulletin boards work and how you can set one up in your library

by
Cathy Moore

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Tech Reports
Room 464
728 State St.
Madison, WI 53706
USA

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Introduction

A bulletin board system (BBS) is a microcomputer that can answer the phone, display and take messages, and receive, store, and send computer files of all types. If you need to transfer messages and files with patrons or colleagues, a BBS might work for you.

Bulletin boards have been set up all over the world to give microcomputer owners a forum for their ideas and a way to share public domain programs. For example, a microcomputer user group often sets up a system to give its members a chance to ask questions and help each other out. Such a BBS usually has a large collection of public domain programs contributed by members and collected from other boards. It also has a way to post important announcements, such as the date of the next meeting.

You can offer a BBS as another service for patrons

In your library, you could set up a bulletin board for your patrons. The BBS could take reference questions when the library is closed and provide a public meeting place where patrons can exchange ideas about books, movies, area restaurants, local government, and other such topics. With the right software, you could even put your card catalog online.

Public-access boards run by libraries offer many services: The Louisville Free Public Library runs a board for patrons that offers a forum for opinions and a collection of public domain programs. The system has some specialized message areas, including ones for foreign-language discussion and book reviews.

The board run at the Liverpool Public Library in Liverpool, New York is up when the library is closed, taking reference questions and interlibrary loan requests. Library staff post news and announcements and make some holdings lists available online.

Odessa College in Odessa, Texas includes a police department "Crime Stoppers" section on their board. Finally, the Texas State Law Library has put their holdings online using MCD, a bulletin board program that has a built-in text retrieval software.

You can set up a BBS for communications between libraries

You could also set up a bulletin board for other libraries. Your colleagues could call to organize the next meeting, send interlibrary loan (ILL) requests, route around a draft of a report, post job announcements, and leave messages when

they're tired of telephone tag. You could put your newsletter online and list continuing education workshop schedules and other news.

The New Mexico State Library posts New Mexico legislative bills on their board. The Mountain Valley Library System in Sacramento makes available text files of automation documents that libraries have used for RFPs. The Office of Public Instruction in Helena, Montana runs an informal BBS for teachers and school librarians, supporting electronic mail and offering public domain programs. And many library bulletin boards are used for interlibrary loan.

Maybe electronic mail or telefacsimile would work better than a BBS

Although a BBS could give you just what you need, make sure another type of system wouldn't do it better. Later in this report we'll compare bulletin boards with telefacsimile and traditional electronic mail to help you determine if you really need to set up your own system.

Research available systems

Also make sure you research the available bulletin board programs and pick the best one for your needs. *Don't buy a program just because another library is using it.* Some people who have called me about our bulletin board at Wisconsin Interlibrary Services in Madison (WILS) want to create an exact clone of it without considering how their needs are different from ours. There are several bulletin board programs available for every type of microcomputer; the one another library is using might not work at all for you. While it's more work initially to research bulletin board programs, choosing the right system will save you headaches later.

This report will first cover the basics of bulletin boards to clear up several very common misunderstandings. Later we'll look at BBS features in more depth, examine some library uses in detail, and give you a step-by-step guide to setting up your own board. Because other publications have covered setting up bulletin boards for patrons, this report will spend somewhat more time looking at features that apply to boards used for communications among libraries, particularly for ILL.

If you run across terms you don't understand, check the glossary. While this report was written with inexperienced computer users in mind, the discussion does get technical at times.

The basics

What is it?

Typical configuration

A bulletin board system consists of:

a microcomputer
a modem connected to a standard phone line
bulletin board software

People calling the system usually have:

a microcomputer
a modem connected to a standard phone line
communications software

The ***bulletin board microcomputer*** stores all the files and messages sent to it. It often uses a hard disk to store the bulletin board program and the files and messages sent by callers.

Callers usually have microcomputers too, but you can also call a bulletin board with a "dumb" terminal hooked up to a phone line, with some limitations.

A ***modem*** lets your computer talk to another one over the phone lines. It converts the digital signals your computer puts out to analog ones, which travel over the phone lines. At the other end, another modem receives the analog signal, converts it back to digital, and passes it on to the second computer. Every computer that calls a bulletin board needs a modem.

External modems are easier to deal with

Modems can be external (in separate units outside the computer) or internal (on a board put inside the computer). External modems are much easier to deal with when something goes wrong—most of them have lights that tell you what's happening. When communication doesn't work as expected and an internal modem is involved, it can be a lot harder to figure out what's wrong because you can't see any diagnostic lights and often can't hear the modem working. *If you set up a bulletin board, you'll be best off giving it an external modem.*

Some bulletin board programs can support more than one phone line. Every line needs a separate modem and serial port in your computer. Special multi-port boards are available to let you attach up to 16 lines to one computer.

Uses a regular phone line

The ***phone line*** used by a bulletin board is the same line you'd hook a phone to. You don't need a special data line for a bulletin board. However, at least one statewide bulletin board is available through a data network.

If your BBS will be available on a limited schedule—such as when the library is closed—don't expect to be able to receive calls on the BBS phone line when the board is down. Although you certainly could plug a phone into the line, people who aren't aware of the board's schedule will call, making the phone ring and possibly not hearing you answer. To avoid disruptions, either don't attach a phone or disable its bell, using the phone only to make outgoing calls.

Bulletin board software answers the phone, displays files to callers, takes their messages, and receives or sends files. *Only the bulletin board needs the bulletin board software.* People calling the board need simple communications software.

Communications software works with a modem to let a microcomputer owner call other computers. Smartcom and ProComm are two communications programs for the IBM PC. *Only people calling the board need communications software.* The bulletin board itself doesn't need a separate communications program—the necessary features are built into the bulletin board software.

Sample setup

A sample setup for communiations among public libraries

Here's the equipment a public library system might use to set up a bulletin board for the system members:

At system headquarters:

IBM AT with a 40 MB hard disk and one floppy drive
Hayes Smartmodem 1200 external modem
PC Board BBS software
a dot matrix printer

At some member libraries:

Leading Edge PC clone
Multitech external modem
ProComm communications software
a dot-matrix printer

At other member libraries:

Apple IIe
Apple 1200 baud external modem
ASCII Express communications software
a dot-matrix printer

The computer running a board doesn't have to be a "real" IBM, as in this example, although you can avoid potential compatibility problems this way. Of course, you could also base the system on a Macintosh or Apple II series computer. There are bulletin board programs available for other computers as well, but they're often not sophisticated enough for library use.

Any type of microcomputer can call the BBS

Notice that some of the member libraries have Apples and some have MS-DOS computers. Any microcomputer can call most bulletin board systems and exchange files and messages. For example, an Apple library can call the board and type in a message for an IBM library. When that library calls, they'll be able to read the message and type a reply.

Things get a little more complicated when libraries want to exchange *files*. This is where the crucial difference between messages and files comes in:

The difference between messages and files

A message is entered online for another caller to read

A ***message*** is usually a note the caller types in while she's online. For example, the ILL librarian at Rudge Public Library can call the board at the public library system headquarters and enter a command at the main menu that says she wants to enter a message. She addresses the message to Knox Public Library and types in a few lines, asking about a request Rudge sent two weeks ago. When she's done, she tells the BBS to save the message. Her message will be written on the BBS computer's disk, added to the other messages left on the board.

A file is prepared in advance, then posted on the board for another caller to copy into her computer

A ***file*** is a computer file sent to the board so another caller can pick it up. *You create the file before you call.* It can include text, such as a draft of the annual report, or it can be a program, a database, or any other file you have on your computer.

For example, the same ILL librarian at Rudge Public Library can use a word processor to type three requests she wants to send to Knox. She saves them on her disk in a file

called REQUESTS. Then she calls the board and enters a command that says she wants to send a file. The BBS tells her it's ready to receive the file, and the librarian tells her communications program to send the file called REQUESTS. The BBS writes the file on its hard disk, separate from all the other files that have been sent and separate from the messages. Later, Knox Public can call the board and get a copy of the file called REQUESTS.

When you call a bulletin board, you can always read messages. But you don't usually display files that have been sent. If you want to see or use a file, you tell the bulletin board to send it to you. Most times, you won't see the file go by on your screen—it will just get copied to your disk. Then, once you've hung up, you can read the file (or run it, if it's a program).

Different types of computers can easily send messages to each other,

It's easy for different microcomputers to send messages to each other, since they type them online and the bulletin board just displays them in a way any computer can read. But when an Apple owner wants to send a file to an IBM PC owner, the Apple owner will have to make sure the file is in a format the IBM can make sense of.

but transferring files is more complicated

Different types of computers can happily share ASCII (plain text) files but they can't run each other's programs. If your callers are going to exchange files, make sure they know how to save word processing files as text-only, with no special commands like underlining.

Also be aware that Apple and IBM computers treat line feeds differently. An IBM needs to see both a carriage return and a line feed character at the end of every line, while an Apple needs only a carriage return. As a result, a text file created on an Apple might display all on one line on an IBM, while a file created on an IBM might end up double-spaced on an Apple. Several public domain programs will convert the carriage return/line feed sequence, and some communications programs can strip or add the necessary characters as they send and receive files.

So,

Messages are notes you usually type online. They're often short comments to another caller or public notices for everyone to see.

Files are computer files you send ready-made to the BBS. Other callers can get copies of these files and use them in their computers.

☞ Note: You can send text files as messages. For example, if you had a rather long message you wanted to send someone, you could type it with your word processor and save it as a plain text file before you called the board. Once you're online, you could tell the board you wanted to type a message. Then, instead of typing it, you could tell your communications program to send the text file you'd prepared. Then the file would be a message that could be displayed online.

Sample call

Here's a call to a simple ILL bulletin board based on RBBS-PC software. *This shows RBBS-PC features, which will be handled differently on other systems.* You can use other programs for an ILL board, and you can use RBBS-PC for applications other than ILL.

Laura types requests offline

Laura, the ILL librarian at Rudge Public Library, types two requests using her word processor and saves them in a file called RUD14KNO. She called it that because it's the 14th of the month and the requests are from Rudge (RUD) for Knox (KNO). The library system established this convention for naming files so callers to the board know which files are for them, when they were sent, and who sent them.

She logs onto the board

Then Laura loads her communications program and tells it to call the BBS at system headquarters. Here's what she sees on her screen (staff at headquarters, if they were to look at the BBS computer, would see pretty much the same thing):

```
     WELCOME TO SYSTEM HEADQUARTERS

What is your FIRST Name? rudge
What is your LAST Name? public
Checking users...
Enter password (you'll see dots)? ......

Granted access level 5
Logging RUDGE PUBLIC
RBBS-PC CPC15.1A with TF040701 applied NODE  1
 OPERATING AT 1200 BAUD,N,8,1
```

This bulletin board asks for first and last names because it's designed as a public system that anyone can call. The library system adapted this and callers enter library names instead.

When the BBS says Rudge has access level 5, it's reporting the security level they've been assigned by staff at system headquarters. Many bulletin board systems use security levels to control who can do what on the system. On this system, callers with an access level of 10 have more power than those at level 5.

The gibberish after "Logging RUDGE PUBLIC" identifies the version of RBBS-PC that's being used. Then the system reports what communications parameters Rudge Public is using, listing baud rate, parity, data bits, and stop bits.

Next, Laura sees the welcome screen:

```
* <Ctrl K>/<Ctrl X> aborts <Ctrl S> suspends *

                              Welcome to the
                          ILL Bulletin Board System

                    If you have problems with the board, contact
                              Martha Koehler  213-555-9047

Times on: 53  Last time on was: 06-13-88 14:40
```

The welcome screen was designed by the sysop

On this system, the welcome screen is a plain text file the staff at system headquarters can design themselves. The line at the top reminds Laura how she can skip this screen or make it pause, and the line at the bottom gives her some statistics about her calls.

Then Laura sees the main bulletin screen:

```
Don't miss the NEWSLETTER WORKSHOP offered at Lincoln Community
College on July 6.  Contact Betty at system headquarters for more
information.

 BULLETIN#   DATE     TOPIC
---------------------------------------------------------------------------
   1       2/10/88    directory of ILL bulletin board callers
   2       6/17/87    leaving files for other callers
   3       4/28/88    best times to call the board
---------------------------------------------------------------------------

Bulletin #(s) [1 thru 3], L)ist, N)ew (Press [ENTER] to quit)?
```

The main bulletin makes announcements and lists optional bulletins

The bulletin board system operator—staff at system headquarters—can post several plain text files called ***bulletins*** on this system. This screen lists the bulletins available and asks Laura to enter the number of the one she wants to read.

If she entered a number, a screenful of text would appear. Laura could go through the bulletin one screen at a time to read the information. On this board, only the system operator (or ***sysop***) can post bulletins. Callers can't send a file and make it a bulletin, or type in a bulletin while they're online. To make

public announcements, callers leave messages addressed to "ALL."

Since she's already seen all of the bulletins, Laura just presses RETURN at the prompt.

The BBS looks for messages for Laura

The BBS looks for mail addressed to Rudge Public:

```
Checking messages in MAIN..
Sorry, RUDGE, NO MAIL for you
```

The fact that there is no mail for Rudge Public doesn't mean there aren't messages Laura might want to read. Callers might leave public messages addressed to "ALL" that Laura could see by looking through the messages.

But since this board is used only for ILL, no one ever leaves any public messages, so Laura isn't going to look for any.

The "no mail" message doesn't apply to files—someone might have left a file of requests for Rudge to download. The system looks only for messages addressed to a caller, not for files.

The system said it was checking messages in "MAIN" because RBBS-PC can support more than one message base: the main one, plus several conferences usually set up for a subset of callers or organized around one topic, such as censorship.

The system gives Laura some more statistics about how many people have called and how many messages are on the system:

```
Caller #  7524  # active msgs: 6  Next msg # 19
```

and then forges on to the main menu:

The main menu

```
39 min left
============================== MAIN MENU ==============================
GENERAL                 MESSAGES                FILES

B)ulletins              C)omment for sysop      D)ownload (get) files
H)elp (or ?)            E)nter a message        L)ist available files
J)oin conference        K)ill a message         S)earch for your files
O)perator page          P)ersonal mail list     U)pload (send) files
X)pert (menus on/off)   R)ead messages
Y)our profile           T)opics of messages     G)oodbye
=======================================================================

MAIN command? G
```

The options listed on this menu refer to features explained later in this report, so we won't go over them all.

Menus were created by the sysop

On this system, the menus are plain text files the sysop can design. Here, the menu shows only the most important RBBS-PC commands because the sysop has turned off the more sophisticated ones, making a system that's easier to use.

Laura has entered E at the prompt, which tells the BBS she wants to enter a message.

Laura enters a message

```
To (press [ENTER] for ALL)? knox public
Subject? request #43
Security: [K]ill, P)assword, R)eceiver, N)one, H)elp? r
Checking users...
Sending personal mail to KNOX PUBLIC

Type message 30 lines max (Press [ENTER] to quit)

    [----------------------------------------------------------------]
 1: What's the status of our request #43, "Learning to Live with
 2: a Pekingese"?
 3:       Thanks.
 4:


A)bort, C)ontinue, D)elete, E)dit, I)nsert, L)ist, M)argin, S)ave

Edit Sub-function <A,C,D,E,I,L,M,S,?>? s
Adding new msg # 19...
```

She makes the message private

When the system asks about the security Laura wants to give the message, she enters R, which means only the caller to whom the message is addressed can read it. If she entered N, any caller who browsed through the messages could read this one.

When RBBS-PC says it's "Checking users..." it's making sure KNOX PUBLIC is a registered caller so someone will see the message.

Laura types the message just as she would in her word processor. She doesn't have to hit RETURN at the end of each line. At line 4, however, she presses RETURN without typing anything to tell the system she's done.

Laura doesn't need to sign the message, saying it's from Rudge Public, because the message header will automatically say "From: RUDGE PUBLIC."

The prompt that then appears gives her the chance to edit her message, save it so Knox can see it, or give up entirely and throw it away. Laura enters S to save the message, and the BBS writes it on its hard disk.

Then the main menu appears again:

```
38 min left
------------------------------  MAIN MENU  ------------------------------
GENERAL                 MESSAGES                FILES

B)ulletins              C)omment for sysop      D)ownload (get) files
H)elp (or ?)            E)nter a message        L)ist available files
J)oin conference        K)ill a message         S)earch for your files
O)perator page          P)ersonal mail list     U)pload (send) files
X)pert (menus on/off)   R)ead messages
Y)our profile           T)opics of messages     G)oodbye
------------------------------------------------------------------------

MAIN command? l
What directories (<U>ploaded files,PROGRAMS,[ENTER] for menu)? u
```

Laura lists files to see if there are any for her

Laura enters L because she wants to see a list of the available files. By looking at their names, she'll be able to tell if there's a file of requests for her.

There are two categories of files available on this system—files uploaded (sent) by callers, and public domain programs made available by the sysop. The filenames are kept in separate lists, so someone calling every day to check for requests doesn't have to read a long list of program names. The system asks Laura which list she wants to see—uploads or programs. Laura enters U to ask for the upload list.

```
* <Ctrl K>/<Ctrl X> aborts <Ctrl S> suspends *

PAU13ADA         10880   06-13-88
CENSORS          12672   06-13-88  notes from censorship meeting
PAU14ADA          2304   06-14-88
RIP14LIN          6284   06-14-88
MON14LIN          2688   06-14-88
GRE14PAU          1152   06-14-88
End of list.  R)elist, name files to download, [ENTER] to quit?
```

Laura looks over the list and sees there's no file for her, since there's no file with "RUD" as the last three characters. There are two files still posted from the previous day (the 13th). One is still listed because Adams Public hasn't picked it up—when they call and download the file, the sysop will erase it from the directory. The other file, CENSORS, will stay available for awhile so everyone has a chance to download it.

The CENSORS file has a note attached to it, describing it. RBBS-PC can ask for a description when a caller uploads a file; if the caller just presses RETURN, the file gets no comment. Callers to this system don't describe request files, since their names make clear what they are and who they're for. But they do describe other files so other callers will know what they are.

There's no request file for Laura--there's no name on the list that ends in "RUD." She downloaded the CENSORS file yesterday, so she just presses RETURN to go back to the main menu.

```
37 min left
------------------------------ MAIN MENU ------------------------------
GENERAL                 MESSAGES                FILES

B)ulletins              C)omment for sysop      D)ownload (get) files
H)elp (or ?)            E)nter a message        L)ist available files
J)oin conference        K)ill a message         S)earch for your files
O)perator page          P)ersonal mail list     U)pload (send) files
X)pert (menus on/off)   R)ead messages
Y)our profile           T)opics of messages     G)oodbye
-----------------------------------------------------------------------

MAIN command? u
```

Laura uploads a file

Laura enters U to say she wants to upload a file (the requests she typed before she called).

The system asks what it should call the file and how Laura will be sending it:

```
Name file(s) to upload? rud14kno
Searching for file...

Upload disk has 10760192 bytes free

Protocol:
A)scii, X)modem, C)Xmodem/CRC,
K)ermit, Y)modem, W)xmodem, N)one? x
XMODEM RECEIVE of RUD14KNO ready.  <Ctrl X> aborts
```

She tells the BBS what to call the file

When the system asks Laura to name the file, it's asking how the file should be named *when it's stored on the BBS computer*. It's not asking what the file is called on Laura's computer. Laura could have created a file called HAROLD and posted it here as RUD14KNO. But to keep things simple, Laura stores files locally with the same name she gives them on the board.

When the BBS says "Searching for file..." it's checking to see if a file called RUD14KNO already exists. It's not looking in Laura's computer for the file. The bulletin board can't see what Laura has in her computer.

Transfer protocols determine how Laura's computer and the BBS communicate

The various protocols are different ways of transmitting data. Most of the protocols listed here can figure out if information has been garbled and can re-transmit data that didn't get through right the first time. Both computers have to use the same protocol. Laura can't tell the BBS she's going to use ASCII protocol and then tell her communications software to use XMODEM.

Here, Laura has picked XMODEM. Once the BBS says it's ready to receive, Laura issues commands to her communications program, telling it to send file RUD14KNO using XMODEM protocol. Her program reads the file off Laura's disk and sends it to the BBS computer, which soon says

```
Upload successful

Describe RUD14KNO
  |----+---1+0---+---2+0---+---3+0---+---4+0
?
```

The BBS asks for a description of the file

The system asks Laura to describe the file, but since the name makes clear what the file is, Laura just presses RETURN. If she were uploading another file, such as CENSORS, she could type up to 40 characters to describe it.

A copy of the file RUD14KNO is now stored on the BBS disk, and Laura still has her copy on her disk.

The main menu appears again, and Laura enters G to say goodbye. The BBS says

```
Now  2:48 PM  Minutes on:  3.8
RUDGE, Thanks and please call again!
```

and then hangs up.

Laura entered a message, checked for requests, and sent a file, all in about 4 minutes.

A short time later, Mike at Knox Public Library calls the board. He logs on as KNOX PUBLIC and sees the same welcome screen and bulletin list as Laura saw. But then the system says

Mike sees there's a message for him

```
Checking messages in MAIN..
Mail for YOU (* = Private)
*19
```

Mike sees that message 19 is for him, so when he gets to the main menu he says he wants to read that message:

```
39 min left
------------------------------  MAIN MENU  ------------------------------
GENERAL                 MESSAGES                FILES

B)ulletins              C)omment for sysop      D)ownload (get) files
H)elp (or ?)            E)nter a message        L)ist available files
J)oin conference        K)ill a message         S)earch for your files
O)perator page          P)ersonal mail list     U)pload (send) files
X)pert (menus on/off)   R)ead messages
Y)our profile           T)opics of messages     G)oodbye
------------------------------------------------------------------------

MAIN command? r
Message base MAIN
Msg # ( 1 to 19, *, <H>elp) to retrieve (Press [ENTER] to quit)? 19
```

The system displays his message:

```
Msg # 19   Dated 06-14-88 14:47:17
 From: RUDGE PUBLIC
   To: KNOX PUBLIC
   Re: REQUEST #43

What's the status of our request #43, "Learning to Live with
a Pekingese"?
     Thanks.

MORE [Y]es, N)o, NS)non-stop, RE)ply,K)ill? re
```

Mike replies to the message

The prompt that appears after the message asks Mike if he wants to see more messages, reply to this one, or erase it. Mike enters RE to say he wants to reply. If he erased it now, he wouldn't be able to enter an automatic reply—he'd have to enter a message from the main menu.

The BBS automatically addresses the new message to RUDGE PUBLIC and says:

```
Security: [K]ill, P)assword, R)eceiver, N)one, H)elp? r
Sending personal mail to RUDGE PUBLIC

Type message 30 lines max (Press [ENTER] to quit)

    [------------------------------------------------------------]
 1: Sorry--the book's at the bindery.  It got chewed up a bit.
 2:

A)bort, C)ontinue, D)elete, E)dit, I)nsert, L)ist, M)argin, S)ave

Edit Sub-function <A,C,D,E,I,L,M,S,?>? s
Adding new msg # 20.
```

Mike gives his reply Receiver security (only Rudge Public can read it) and types and saves his message.

Then the BBS displays the original message from Rudge again, so Mike can delete it or leave it on the system. At the bottom of the message, the system says

Mike erases the original message

```
MORE [Y]es, N)o, NS)non-stop, RE)ply,K)ill? k
Killed Msg #  19
Msg # ( 1 to 20, *, <H>elp) to retrieve (Press [ENTER]
```

Mike enters K to erase the original message. The system asks if he wants to see any more messages. He presses ENTER to return to the main menu since he knows there aren't any more messages for him, since the system told him about only one message.

```
B)ulletins                C)omment for sysop        D)own
H)elp (or ?)              E)nter a message          L)ist
J)oin conference          K)ill a message           S)ear
O)perator page            P)ersonal mail list       U)plo
X)pert (menus on/off)     R)ead messages
Y)our profile             T)opics of messages       G)ood
==========================================================

MAIN command? d
```

Mike downloads the file from Laura without having to list the filenames

Rudge Public sends Knox a file every day, but no other library does. Mike can safely assume there's a file for him to download, so he enters D. If Mike wanted to see a list of the available files, he could use the L command as Laura did. Or he could enter S to have the system display the a list of files that have KNO in their names. You don't have to list the files to be able to download one—if you already know the name, you can just go ahead and ask for the file.

```
Name file(s) to download? rud14kno
Searching for file...

Protocol:
A)scii, X)modem, C)Xmodem/CRC,
K)ermit, Y)modem, W)xmodem, N)one? x
FILE SIZE:  8 blocks  1024 bytes
Transfer time: 0 min, 11 sec
XMODEM SEND of rud14kno ready.  <Ctrl X> aborts
```

Mike knows today's file from Rudge will be called RUD14KNO because of the naming convention set up by the library system. If Rudge hadn't sent their file yet, the board would tell Mike there was no file with that name.

When the board says it's ready to send the file, Mike tells his communications program to receive a file with XMODEM and store it on his floppy disk with the name RUD14KNO. Again, he could give his copy of the file any name he wanted, but he also likes to be consistent.

The BBS sends the file and Mike's communications program writes it on his disk. Then the system announces

```
Download successful
```

Mike now has his own copy of the requests. A copy of the file remains on the board, and there's still a copy on Laura's disk.

When the main menu displays again, Mike enters G to log off, because he doesn't have any requests to send.

Summary

Here's what happened:

Laura at Rudge Public called the bulletin board at system headquarters. She saw a welcome screen identifying the board and read the main bulletin, which announced a workshop and listed optional bulletins she could also read. She moved on to the main menu, where she entered a private message for Knox Public asking about the status of a request.

After she saved the message and returned to the main menu, Laura listed the files available for downloading and saw there were none for her. She sent a file to the board for Knox Public to download later and then logged off.

Later, Mike from Knox Public called and saw that message 19 was for him. When he got to the main menu, he said he wanted to read message 19. When he was done reading it, he entered a reply. He saved his reply and the system displayed the original message again. Mike deleted the original message and returned to the main menu. Since Rudge Public sends Knox a file every day, Mike assumed there was a file for him. He downloaded the file and logged off.

Fax and E-mail

Advantages of bulletin boards over telefacsimile

There are several advantages to having information in a computer file instead of on paper

If you need to send textual information like requests and reports to other libraries, you might think a fax network would work well. In many situations, telefacsimile would be a good solution. But standard fax machines have one major drawback: the information ends up on paper. You might prefer to receive computer files for several reasons.

Customized information for patrons

You can improve service to your patrons if you receive information in computer files. For example, if another library faxes you a printout of search results from their compact disk database, you can do nothing but hand the paper to your patron, along with printouts of what you found in an online database. If, however, the search results were sent as a computer file, you could combine this with the data you downloaded from an online database, sort it, and print out a customized report.

Less redundant work

You can also avoid redundant work by transferring computer files. If you're compiling a report that several people contribute to, you could have them fax printouts of their sections. Then you'd have to type it all in again to make the final report. Instead, you could have them send text files of their work for you to edit and combine electronically without having to retype a word.

Easier to manipulate information

Also, you can store and manipulate information in more sophisticated ways if you receive it in computer files. For example, if you receive requests on ALA forms sent over a fax machine, about all you can do is file the requests in boxes and manually thumb through them. But if you receive requests electronically, especially if they come as database records, you can store and manipulate them electronically. Then you could immediately find requests by searching on any element and generate far more complex statistics than you'd ever have time to do manually.

More efficient

Finally, telefacsimile often involves an extra step. Often fax owners print out information that's stored in a computer and then fax the printout. Simply sending the computer file is

more efficient, unless the receiving library wants only a paper copy.

While fax boards that fit inside computers can transfer computer files in limited formats, they require expensive scanning equipment to be able to send paper-based information and, for best results, need a laser printer at each site. Setting up one bulletin board and supplying modems to libraries in the system would be much cheaper if you're interested in sending computer files only.

Differences between bulletin boards and electronic mail systems

If you're used to electronic mail systems, you probably noticed several differences between those and the bulletin board system you saw demonstrated by Laura and Mike. Here are some differences that are important to remember:

There are no mailboxes.

Bulletin board systems often put public and private messages together

Few bulletin board systems I've seen have separate mailboxes for each caller. Instead, all the messages are treated as one group, although some systems do put private mail in a separate section.

Picture the message board at a conference. On it are several folded-up pieces of paper with people's names on them and the messages hidden inside, and scattered among those are announcements like "Any law librarians here? Meet at the bamboo plant for lunch at 12:00."

A BBS is the electronic equivalent of this low-tech message board. The folded-up pieces of paper are private messages, like the ones Laura and Mike sent each other, while the open announcements are public messages anyone can see.

Many bulletin board systems will say you have mail only if there's a message addressed specifically to you. There might be open messages you'd be interested in too, but you have to go looking for them, just as you have to scan public notices on a conference message board to see if any might apply to you.

So, when you enter a message or send a file intended for another caller, the message or file usually doesn't get put in

anything like a mailbox. It gets tossed in among all the others. Security features (like the Receiver security Mike and Laura assigned to their messages) determine who sees what. When you call a bulletin board, you don't usually "check your mailbox." You look to see if there are any messages for you.

There's more public discussion.

Standard electronic mail systems usually have separate areas for public messages. For example, you log on, see your private mail, and then have to move to another section to take part in the debate over censorship in libraries or advertise the fiche copier you're trying to sell.

It's easier to join a public discussion on a bulletin board

But because they don't have mailboxes, most bulletin board systems mix the public and private messages together, so you can send private and public messages from the same spot. This makes most bulletin boards more sociable than electronic mail systems.

On public bulletin boards, like the ones microcomputer user groups run, most callers simply scan all the messages added since they last called, looking at the topic of each message. Then they identify which ones they want to read. Often messages will be addressed to one person but will be left public, so anyone can read them and join the discussion. Other times, messages will simply be addressed to ALL or to groups who would be interested in the message, such as LAW LIBRARIANS.

File transfer is easier.

Many E-mail systems require you send files as messages

Many electronic mail systems let you send files in only a limited way, as messages. For example, if Laura were sending Mike some requests over an electronic mail system, Laura would have to tell the system she wanted to send Mike a message and then tell her communications program to send the file. The text of the requests would appear one line at a time and would be saved as a message. The electronic mail system wouldn't think it was receiving a file; it would just think it had a very fast typist online.

When Mike logged on, he wouldn't be able to simply download the requests. He would have to display them (read his mail) and capture them as they go by, telling his communications program to save everything it sees.

While many people use electronic mail this way, it has several disadvantages:

It takes a long time. If you have a lot to send this way, both you and the recipient have to sit and stare at the screen as

the full text of the file scrolls by.

It's expensive. Partly because it takes a long time and partly because you're paying connect charges, sending files this way can cost more than sending them through a bulletin board, even if you have to call the BBS long distance.

Traditional E-mail systems support only text files

You can send only plain ASCII files. Many E-mail systems marketed to librarians let you send only text files as messages, since you're just sending the information instead of typing it. So if you use a great public domain program to sort your book lists, you can't send it to a colleague.

The system handles few protocols. Since many electronic mail systems can handle only text files, they support only ASCII protocol. This way of transferring data doesn't check for errors, so noise on the phone lines will garble your text, possibly deleting portions of it. Some of the newer E-mail systems do handle several transfer protocols.

Because a bulletin board system treats files separately, transferring files is a lot easier. You don't have to watch the whole file go by and capture it; you can just copy it onto your disk using a transfer protocol that protects the data from noise in the line.

☞ Note: At least one BBS program (MCD) attaches files to messages. When you want to send a file to someone, you enter a message to that person and then tack the file onto the end. This system supports more than just text files—you can send programs, too—and the recipient doesn't have to display and capture the file. Once they've read the message, they simply download the attached file.

A BBS can't forward messages.

E-mail systems are better if you need sophisticated message handling

If you need sophisticated message handling, electronic mail has the edge over most bulletin board systems. This can be a very important difference for some interlibrary loan systems in particular.

If you need a system to transfer ILL requests, you might consider using an electronic mail system instead of a BBS. If you send requests as messages, you'll suffer the problems listed above, but you'll also be able to forward requests easily when the first potential lender says "no." If each request is a message, the same one can move from lender to lender without ever being retyped. Delaware Co. Library System in Media, Pennsylvania uses Chairman, a PC-based electronic mail system, for interlibrary loan. Members of the system type requests offline and then call and send them as messages, which can get routed from lender to lender.

If you send requests as messages on a BBS (one request per message), you probably won't be able to do anything to the message to send it to someone else. You could upload the same request as a message addressed to someone else, however. This would probably require you to keep each request in a separate file on your disk.

If you send requests as big text *files* on a BBS, it's more trouble to forward a request. Here's what could happen: Rudge Public sent Knox Public five requests and Knox couldn't fill one of them. Now Laura at Rudge wants to send that request to Monroe Public. She has to edit the original request file to isolate the troublemaker and save it as a separate file. Then she has to call the board and send that new file, appropriately named. (However, if Laura kept her requests in a database, storing each request as a record, she could just put the appropriate record in a file to send again.)

If you have more than a small number of requests to send, any system that requires you to treat each request as a separate file will become very cumbersome very quickly.

You can't have sophisticated real-time conferences.

Many bulletin board systems can't let multiple callers chat with each other

Many bulletin boards don't let several callers get online at the same time and converse by typing. In fact, most boards run by libraries can support only one caller at a time. The sysop can chat with a caller, but the caller can't talk to another caller because there's only one phone line going to the BBS.

But electronic mail systems available through commercial networks can have several callers online at once. The systems often have a separate section where you can talk by typing at each other.

While you can also set up your own multi-line BBS, this can be expensive. As a result, discussions on a BBS are usually carried on through a long trail of messages. A caller will read what's been said so far, have his say, and then log off. The next caller will do the same. If you need real-time conferencing and a human-to-human conference call won't do, you'll need either an expensive, sophisticated BBS with multiple lines or access to a commercial electronic mail system.

☞ Note: You can get sophisticated electronic mail systems that run on microcomputers, although they're expensive. Programs like those listed at the end of this report have good electronic mail features, and some (like Chairman) let you transfer programs as well as text files. This gives you the advantages of full-fledged mail without the access charges.

BBS Features

Here are some typical features of bulletin boards. You should determine which ones your system will need, and then make sure the program you're considering buying has the necessary features.

Bulletins

Bulletins are public announcements stored in text files created by the sysop

Every bulletin board system I've seen has at least one information screen every caller sees when they log on. The sysop can use this screen to identify the bulletin board and make announcements she wants every caller to see. Many bulletin board programs let you set up several logon screens.

RBBS-PC and other programs separate the welcome screen (the one that identifies the BBS) from the main bulletin. Many programs let you set up several optional bulletins that are listed on the main bulletin screen. This way, you can force your callers to see the main bulletin, but you don't make them trudge through more information unless they want to.

For example, if you run a BBS at a library network, you could use the welcome screen to identify the board ("Welcome to the network BBS") and use the bulletin screen to announce the next library directors' meeting. The bulletin screen would also list any optional bulletins that are available, and the program would probably give callers a chance then to identify bulletins they want to read.

With RBBS-PC and other programs, all these screens are plain text files the sysop can set up and change at any time. Callers can't enter or change bulletins, but you could make the bulletin files available for downloading.

Many bulletin board programs let callers skip the bulletins

Many systems let you decide if a caller can skip the logon announcements. If you do this, the system might ask if the caller wants to see the bulletin, or it might give them a chance to cancel it when it starts to display. It's usually a good idea to avoid this and require callers to look at the screens, or they might never look and will miss announcements.

When you design your welcome and main bulletin screens, bear in mind that callers have to see these every time they're online, so keep them short and to the point. You'll also find that callers will ignore information in the bulletin after they've

seen it once, so every time you change the news, make the bulletin look substantially different to catch everyone's eye.

At WILS, we often use bulletins to help callers deal with the board. For example, if we notice that several callers are going through extra work to read messages, we'll very briefly describe the shortcut they can use. We'll put more detailed information in an optional bulletin.

Help screens

A good program will let you edit the help screens

A good bulletin board system will come with help screens you can edit. RBBS-PC and other programs store the help screens as separate text files, so you can edit them to fit your system and your callers. At WILS, we rewrote all the RBBS-PC help screens and added examples that applied to ILL use.

Expert and novice modes

Callers should be able to control how much help they get

A good BBS will let callers determine how much information they see. Some systems give only two choices: the menus display, or they don't. Other systems offer several levels of menus, from detailed to sparse.

Many systems let callers concatenate multiple commands

While many programs re-display the menu every time the caller is finished with a command, others display the menu only once and then offer only a prompt that contains an often cryptic reminder of the commands that apply. And most systems let callers combine commands. If a caller is doing work that requires him to enter multiple commands at submenus, he can enter all the commands at once, usually separating them with semicolons. For example, Laura could have uploaded her file in one step by entering ***u;rud14kno;x*** at the main menu.

To find out how well a BBS program handles menus, call a public board that uses the program.

Security

Security levels determine who can do what

A good bulletin board system will let you assign different security levels to your callers to control how much they can do. While you, as the system operator, can probably call your board from home and maintain it, you don't want everybody to have that kind of access.

For example, a board for library patrons should limit the patrons' access to keep troublemakers from deleting important files or trying to take down the system. Even if trusted colleagues are your only callers, you'll want to give them limited access to prevent them from accidentally wreaking havoc.

A good board will let you assign different security levels to each command. For example, you can give the upload command a security level of 6, so only callers with that access level can upload files. If a caller who had been assigned a 5 tried to upload a file, the board would tell them they didn't have authorization. You'd give the logoff command the lowest security level, since you want everyone to be able to log off.

Security features restrict what new callers can do

These kinds of security features let you restrict new callers' access. For example, when a stranger logs onto the ILL board at WILS, RBBS-PC looks in the file of registered users to see if someone with that name has already called. If not, the system asks the caller where she's from and creates an entry for her, assigning her a low security level. It displays a text file we created that tells the new caller that this is a private board and warns her that she won't be able to enter messages or transfer files. This is because the security level we give strangers is so low all they can do is read bulletins and public messages, enter a message only the sysop can see, and log off.

When we check the callers log, we'll see that someone new called. If we know she should be a regular user of the board, we'll edit her registration entry to give her a higher security level.

We could also use security features to completely lock out any callers who haven't registered with us. If we did this, RBBS-PC would simply tell the stranger "Access denied" and hang up. We decided against this approach for two reasons.

Sometimes legitimate callers make typos without realizing it when they log on. We didn't want them seeing an inexplicable, rude message, so we let them get on. In the text file that displays to strangers, we say that if the caller has been on before he probably just made a typo, and RBBS-PC gives him a chance to log on again.

We also occasionally let other librarians browse through our system to see how it's set up. By giving strangers a security level that lets them look around but not do anything potentially dangerous or offensive, we let others see our system and don't have to worry much about the phone number getting around.

Because we give new callers a low security level, library staff talk to a WILS staff member before they call if they want to send requests on our board. Then we enter their logon names and passwords in the user file and give them the regular access level. Callers can't change their own security.

Public vs. private files

Almost every BBS lists the files it has available, with short explanations of each one, so callers can see if there's anything they need. If there are a lot of files, the lists are usually divided into categories. For example, when Mike calls the local IBM PC user group BBS, he can look at a list of all DOS utilities to see if he wants to download one.

Often the sysop creates the lists of files and can let some available files remain hidden by not listing their filenames

Usually, all the public files are kept on the same drive in the BBS computer, although they might be organized into different subdirectories. And, often, when a caller asks to see a list of the available files, the bulletin board software *doesn't* look to see what's on the disk and show that list. The program displays a text file created by the sysop showing what the *sysop* wants people to know about.

Many systems won't immediately list uploaded files as being available, although they can be downloaded if callers know about them

When someone uploads a file, many systems won't show the file's name when the next caller asks to see what's available. This gives the system operator a chance to check the file and make sure it's okay, and also makes it possible for callers to exchange private files.

For example, if Rudge Public wanted to send Knox a draft of a joint letter they're planning to send to Adams Public, Rudge and Knox won't want Adams to see the letter before it's done. They can leave a note for the sysop saying the file is private, so the staff at system headquarters won't read it or list it as available to the whole world. Knox and Rudge would leave private messages to each other when they'd uploaded a new version of the letter. But if the file was automatically listed as available, Adams staff might notice that there was a file called "ADAMLTR" and download it out of curiosity.

Creating file lists can be cumbersome

If you expect your callers will be transferring a lot of files, try to determine how much work this will create for you. BBS programs differ markedly in their ability to automate the tedious procedure of maintaining file lists. Often, talking to someone who runs a bulletin board is the best way to find out how cumbersome a particular program is.

The version of RBBS-PC used at WILS (15.1a) doesn't automatically categorize files or create file lists, although these features are supposed to become available in future versions. We use batch files for this: the batch file looks at the directory of part of the BBS disk, sorts this information, and appends it to a text file. The resulting file displays when a caller asks for a list of files. The batch files go to work whenever we run certain utility programs, so the lists of available files are updated several times a day. We have a "hidden" subdirectory where we can store files we don't want listed as available.

Searching for files

Bulletin boards differ widely in the ways they display the names of files available for downloading. While some programs let callers search for particular filenames, others make you page through all the files to see if the one you want is there.

Some bulletin board programs let callers search for files by name, while others force them to read through lists

For example, if you're looking for a public domain bibliography program called BIBMAKER, you could call one bulletin board and ask it to display all files that have the word "bibmaker" in their names. If the board has BIBMAKER.EXE, the file will show up. But if you called another type of system, you might have to guess which category the file is in (utilities or word processing, for example) and then look through the entire list in that category. If you're lucky, the list will be sorted alphabetically. A few systems or sysops list files in reverse chronological order, showing first the ones most recently uploaded.

Conferences

A conference is a subset of messages organized around a topic or set aside for a group of callers

A BBS "conference" is usually a subset of messages, and sometimes a subset of files, separated from the rest of the BBS. Some bulletin board programs call conferences "areas."

Anyone can join public conferences

Conferences can be public or private. Any caller can join a ***public*** conference, which is usually a subset of messages grouped around a topic. Public conferences can be handy when there are a lot of messages on the board and you want to categorize them by topic.

For example, the local Macintosh users group has set up several conferences based on topics, so you can go to the software conference to see only the messages that concern software. That way you don't have to wade through "for sale" notices, discussion about hardware, and political arguments.

If your callers own many different brands of computer and want to talk about them, consider setting up a separate conference for each brand. The BBS run by the North Dakota State Univ. Computer Center has multiple message bases serving different computers, including IBM, Macintosh, Apple II, and Commodore. Remember, you don't have to set up different conferences for different computers, since everyone can read messages no matter what computers were used to enter them. The separate conferences are only ways to organize messages by topic.

Only some callers can join private conferences

Private conferences are usually set up for a subset of callers. For example, a public library bulletin board set up for patrons could have a conference for the trustees and friends of

the library. Only the trustees and friends would be able to get into the conference and read the messages there.

Some bulletin board programs make files available through conferences. For example, a bulletin board like the one in North Dakota described earlier might associate files with each computer's conference. If you wanted to see which Mac files were available, you'd have to go to the Mac conference. On other boards, the files are available centrally and only the messages are separated into conferences.

Message threading

Message threading links messages by topic

If your bulletin board system has ***message threading***, you might not need to use conferences to organize messages. Message threading links messages by topics, making it easier to read all postings about the same topic.

For example, a caller might leave a message asking if anyone had information on microcomputer-based circulation systems. The caller entered the message topic as "circ systems," so all replies to that message should also have "circ systems" as the topic. If you see the message and want to read all the replies to it, you can tell the system you want to see all other messages on that thread. On a BBS without threading, you would have to scan through all the messages to find the ones that dealt with circ systems. Message threading won't work well unless callers reply to messages with the "reply" command—if they enter individual messages, the system might not be able to add them to the thread.

Comments vs. messages

Comments are messages for the sysop

Some bulletin boards offer a separate "comment" command that will leave a message for the sysop's eyes only. It's slightly more convenient to use this than to enter a private message addressed to the sysop.

Other systems give you a chance to leave a comment when you log off. This is a little less handy, since you'll have to remember what you wanted to comment on.

Questionnaires

Many BBS programs let you post questionnaires to be answered online

Many bulletin board programs let you write questionnaires that callers can answer online. A good program will have a sophisticated (but easy to learn) questionnaire language, so you can use if/then logic and branching, giving callers different questions depending on their answers to earlier ones. You could conceivably use the questionnaire feature to have callers enter ILL or reference requests online.

Often, callers can access the questionnaire through the main menu. Some systems can also present the questionnaire at the end of the call—when a caller tries to log off, the system asks them to answer the questionnaire. If this is how your system works and you're just doing a survey, make sure the first question is "Have you answered the questionnaire already?" so your callers can get away quickly.

You have to write a script telling the BBS what questions to ask and how to display them

Questionnaires I've seen present one question at a time and can support both short, free-text answers as well as multiple choice. Writing a questionnaire is similar to writing a batch file—you'll use labels in the script for branching and are pretty limited in the commands you can use.

The script language included with RBBS-PC lets you position questions on the screen, branch to subroutines, and check to make sure a caller gave an acceptable answer (for example, they didn't enter "J" when they were told "Please enter A, B, or C.").

The BBS program will save your questionnaire results in a file, ideally in a format that makes it easy to tabulate responses. RBBS-PC doesn't put questionnaire responses in an easy-to-read format. It simply lists the caller's name and the time they filled out the questionnaire, followed by their responses, one per line. You have to match up the responses to the questions.

Make sure the BBS will save questionnaire responses in a useful format

The format of questionnaire responses can be very important if you want to use a script to take ILL or reference requests from callers. It sounds like it should be easy to set up a system that will prompt the caller for the right information, and this is a good alternative to having them enter messages and hoping they include everything you need. But you could run into two potential problems: your BBS program might not support the long free-form information requests would require, and it might not save the answers in a convenient format. If you want to use a questionnaire as a way of filling in forms online, carefully examine the script features of every BBS program you consider.

Database management

Some BBS programs include built-in database managers or text retrieval software

A few bulletin board programs (including FYI's MCD, Infohost, and Galacticomm) have database management features built in, so you can make a database available online without requiring your callers go out a window to another program (described below). If one of your main reasons for setting up a BBS is to offer access to a database stored on your hard disk, make sure you look at these and any similar programs.

Often the database management program that's built into a bulletin board is designed to handle text. A good system will index your text files without requiring you to convert them. You shouldn't have to type information all over again just to get it into the database.

The Texas State Law Library uses FYI's MCD program to make their card catalog available online, and the Clinton Herbarium at the Buffalo Museum of Science uses the same program to make botanical databases available. MCD supports Boolean operators and indexes every word.

If you want to make a compact disk database available online, things get more complicated. The database management features in current BBS programs probably can't handle CD-based information. You might have to make the specialized CD searching program available through a window.

Order taking

An order-taking system might work for requests

A few bulletin board programs (including Galacticomm and PC Host) are designed for businesses who might want to take orders online. The order-taking feature might be adaptable to ILL or reference requests. If the main purpose of your board is to take requests from callers, look at the order-taking programs.

Windows or Doors

A window lets callers out of the BBS software and loads another program

Several BBS programs let callers exit the system entirely through a "window" or "door" and run a different program that's stored on the BBS computer.

You could make a database available through a window

For example, if you had a database you wanted your callers to be able to search but your BBS program didn't have any database capabilities, you could make the search program available through a window. Callers would tell the BBS they wanted to go out the window to the database. The system would let them out of the bulletin board program and automatically load the database searching program. When they were done with their search, callers would return to the BBS to log off. See the "Database management" section for more information about online databases.

You could also use a window to have callers fill in forms online. If the questionnaire features of your system are too limited for your reference requests or other applications (see below), you could write a program that would prompt for the information and save it in the format you need. You could make this program available through a window, so callers would temporarily exit the BBS program to enter the information.

A poorly-handled window is very dangerous, since it might allow hackers access to DOS and to all the files on the BBS computer. If you want to use windows, make sure any BBS program you consider handles them very carefully and guards against any unauthorized tinkering.

Configuration program

All bulletin boards give you some control over features, letting you determine security levels, activate or de-activate commands, tell the system where files are stored, and set up other features.

Look for a flexible BBS program that lets you control most features

When you look at bulletin board programs, find out how flexible the system is. Can you control how individual commands work? Can you change the wording of the prompts? Can you tell the system which menus to use? Make sure the changes you'd like to make to the standard configuration are possible.

Some bulletin board programs put most of the setup and configuration work in a separate program, while others incorporate it in the BBS itself. RBBS-PC combines these approaches, having you run a separate program to configure the board but also offering some control over it while you're logged on as sysop.

Paging

Callers can bring the sysop over to the BBS computer by making it beep

Most bulletin board systems let callers page the system operator by telling the BBS computer make some sort of noise. When callers to the WILS BBS enter "O" at the main menu ("Operator page"), RBBS-PC will make the computer beep. This will bring the system operator or other staff over to the computer, where they can chat with the caller and help her out.

It's a good idea to make paging available when your board is just starting out, so callers who aren't used to the system can easily ask for help. It's much easier to help someone online than to try to describe what to do over the phone later. Very few callers will abuse paging and use it just to say, "I was wondering if you guys got that new printer yet..."

Time limits

Most BBS programs hang up when a caller's time has expired

A good BBS program will let you set a time limit on calls. Some will hang up when a caller's time has expired and refuse to let them on again for 24 hours. This is an extremely useful feature if you have a popular board that's always busy.

But while most systems will hang up on callers whose time has expired, they often can't refuse access to the same caller

again. Determined callers will just call back when they've been hung up on.

When you look at bulletin board programs, try to determine how polite they are about disconnecting. A good program will warn the caller when their time is running out and won't hang up if the caller is in the middle of doing something, such as transferring a file or entering a message.

The BBS should hang up on callers who don't enter any commands

If a caller stops entering any commands, the bulletin board system should hang up after about two minutes. Otherwise people will call and then have to leave their computer for some reason, tying up the board.

Callers log

The callers log records who called and what they did

A good bulletin board system will keep a log of calls, recording who called and what they did. Some programs let the sysop determine how much information about each call gets recorded, so you can pick how detailed each report will be.

RBBS-PC displays the callers log online to the sysop and can also print the log entries as they're made.

Statistics

Look for a BBS program that keeps stastics on use

A good BBS program will generate statistics about board use. For example, the system might be able to tell you how many people called last month, breaking down the figures to show calls per hour. This helps you determine when the board is likely to be busy and gives you an idea of the level of use.

Multiple nodes

Some BBS programs handle multiple phone lines easily, while others require you run a separate copy the program for each line

If you get so many callers that the board is always busy, you'll want to add another phone line and modem, creating another *node*. Some BBS programs let you add a new phone line rather easily, handling simultaneous callers without much trouble. Other boards, like RBBS-PC, require you run two complete copies of the program at the same time, using a multitasking program to divide the computer's memory. Some BBS programs are designed to handle multiple lines and are even bundled with multi-port cards you put in your computer.

Usually, both nodes on the board access the same messages and files, although you could run two completely different boards on the same computer. Many BBS programs let callers see who's logged onto the other node and let the callers chat.

Source code

Sometimes you can get the source code of a BBS program and customize it

A few bulletin board programs are available in their uncompiled state—you can get the source code, change it, and compile it, creating a customized BBS. This can be handy if you need to make changes that the software's configuration program doesn't allow. For example, we didn't like some of the wording RBBS-PC uses in its prompts, so we modified the source code.

Having the source code can be very handy if you want to add your own routines to the board. For example, if you want to accept reference requests or similar information online and don't want to use a questionnaire to do it, you could add a command to the system and a routine that will prompt for the information, saving it in the format you want.

At WILS, we added a short routine to RBBS-PC that made it possible for us to automate request printing. Just a few lines added in several modules identify requests for WILS, save the filenames in a special list, and tell the caller that their requests got through all right and will be printed.

If you want to modify your program's source code, you'll have to find out what language it's in and buy the necessary compiler. If you hire a programmer to make the changes, make sure she thoroughly documents everything she did. Also allow a lot of time for the changes, since it might be hard to figure out how the program works. RBBS-PC is widely known for its "spaghetti code"—disorganized programming that's hard to understand and modify.

A good manual and support

BBS programs often have confusing manuals written for hackers

Bulletin board programs are notorious for their dreadful manuals, so it might be hard to find a program with documentation that could qualify as "good." You'll probably have to settle for a marginally useful manual.

Since traditionally only computer hobbyists set up bulletin boards, many BBS software manuals are written for people already intimately familiar with their computers. If you can, look at a program's manual before you buy it, and certainly talk to the program's publishers. If the people selling the program can't answer your basic questions clearly, consider looking for other software.

If you're attracted to a program that has a poor manual and worse support, you might be able to get by if a local sysop who uses the program is willing to help.

Multitasking

Using your BBS computer while it's running the board

A multitasking program can let you use your computer while it's running the bulletin board system

Many bulletin board programs can run happily without using all the memory in your computer. If you use a multitasking program, you divide your computer's memory, running the BBS in one section and leaving the other free for word processing or other work.

Your work at the keyboard will affect only the memory you're using—what's displayed on your screen. The section of memory that's in the background will continue undisturbed. You can switch sections with a simple command.

The multitasking program you use and the amount of memory you have to give to the BBS will partially determine how much you can do in the free section of memory. If you haven't left yourself much memory, you won't be able to run large programs or open big files. And a weak multitasker will let your work interfere with the board, usually by slowing down the system.

Several libraries use DoubleDOS (from Softlogic Solutions) for multitasking. At WILS, we use it to divide the BBS computer in two The bulletin board gets most of the memory and gets 2:1 priority over system resources, so the BBS gets first crack at the computer even if we're using the free section of memory. While we used to use the free section for general word processing, we had to increase the amount of memory given to the BBS when we upgraded it and added a print spooler. As a result, we use the free section of memory only for board maintenance.

Even if you're left with only a little RAM, it can still be handy to have access to the computer while the board is up. Since our word processor (PC-Write) still fits in the free section of memory, we can edit bulletins while we're logged onto the board, making sure they display properly. And, if a caller pages us, worried her file didn't get through intact, we can check the file while the caller's still online.

Sometimes you need a multitasking program to hook two phone lines up to your board—you might need to run two copies of the BBS program, one in each section. The Mountain Valley Library System in Sacramento uses Desqview to support two nodes to their OPUS system.

Making decisions

Because bulletin board programs are complicated and library uses of them often involve large numbers of people and changes in policy, you should carefully plan how to get the system going.

Here are some types of library boards, with general policy considerations and decisions you should make before you buy a BBS program. The next section offers one plan you can use as you choose a program and decide how to install it.

Using a BBS for interlibrary loan

You could set up a board to take requests from other libraries and directly from patrons. ILL boards are becoming increasingly popular; callers use them to send requests to each other as well as to the library that's in charge of the board. A file compiled by the ASIS Special Interest Group on Personal Computers lists 38 library bulletin boards; of these, 18 are used for interlibrary loan.

If you want to set up an ILL board, you have several important decisions to make:

Should callers enter requests online or offline?

Your callers could type their requests while they're on the board, or they could type them into a text file offline and then send the file.

If you have a all number of callers with few requests, they could enter them online without tying up the board

If you expect only a few callers and none of them are calling long-distance, you could have them enter requests online. They could type the requests as messages, or enter them by responding to a questionnaire.

Online: messages

If you use ***messages***, you'll have to decide if the requests should be in separate messages or if they can be combined. Both of these approaches have disadvantages: the receiving

Recipients have to view each message online to capture it to disk

library, whether it's the sysop or another caller, will have to print or capture the messages somehow. They'll probably end up with extraneous information on their printout or file, including BBS prompts, and they'll have to view each message online to process it.

If you plan to use messages for requests, consider using a commercial electronic mail system or setting up your own. This will give you more sophisticated control over the messages, letting you forward them to other potential lenders.

Callers could type requests offline and send the files as messages

You can have callers type requests offline and still send them as messages. A caller could create a text file of requests, call the board, tell the system he wants to enter a message, and then send the text file instead of typing the message. The system responds as if the caller typed the message. This cuts down on the time callers spend online.

Online: questionnaire

You could probably use a questionnaire to prompt for request information only if the requests were for you

Most likely, you could use the ***questionnaire*** approach only if the requests being sent were all for you. BBS programs put all the questionnaire responses in one file, a file that other callers can't get. This means all the requests would be in one file that's inaccessible to other callers. The questionnaire responses might also be completely unformatted, leaving your staff to puzzle out which field is which just by the relative position of the text.

Offline: files

If requests were sent as files, recipients wouldn't have to view them online and capture them

If you have callers type requests offline and send them as plain text ***files***, they would be available to all callers and the request recipients wouldn't have to view and capture them. If you send requests in separate files for each lender, callers would simply download the files that were for them and print them off once they've hung up.

If you go this route, you have some more important decisions:

How many requests should go in each file?
How should the files be named?

And ***no matter which approach you take,*** you'll still have to decide:

How often should people call?
How long should requests stay on the board?
What format should the requests be in?

If callers enter them offline, how many requests should go in each file?

It's probably simplest for each borrower to group requests by lender. So Rudge Public will put all today's requests for Knox Public in one file and all the requests for Adams in another.

How should the files be named?

Set up a file naming convention that ensures unique names

When you consider a naming convention for the request files, remember that every file has to have a unique name. If, for example, Rudge Public always calls its files for Knox "KNOX," the bulletin board would refuse to accept one day's file if the previous day's was still on the disk.

One way to make a unique filename is to include the date: Rudge could send a file called "KNOX03" on the third of the month. But if more than one library sends requests to the same lender on the same day, the filenames would no longer be unique. You could get around this by including the source library's name in the filename, like "RUDKNO03" or "RUD03KNO." You could use an extension (like ".2") to identify another file sent by the same caller for the same lender on the same day. If your bulletin board is run on a computer that allows longer names (such as a Macintosh), you'll have more flexibility.

You might also be able to keep filenames separate by including the number of the first request. Then, a file from Rudge that starts with their request #1209 for Knox could be called "RU1209KN." You might be able to leave out the borrowing library's name (for example, "KNOX1209") if you're quite sure two callers won't send files to the same borrower that start with the same request number.

How often should libraries call, and how long should requests remain on the board?

Whether you post requests as files or as messages, you'll have to decide how often libraries should call and how long you'll let requests clutter up the system.

If you have a lot of callers, have them batch requests and call only once a day

On a smaller system—one with 15 or so callers—libraries could probably post requests as soon as they got them without tying up the board too much. If you have more callers, consider having them batch requests and send them only once or twice a day. The WILS board has about 40 regular callers, about 30 of whom call once a day.

Make board access as convenient as possible

Try to avoid setting up a rigid schedule that tells libraries when they can call. Many ILL librarians don't have easy access to a microcomputer with a modem and have to reserve time on equipment in another department. Make board access as flexible as possible to avoid inconveniencing your callers. The ILL board run by the New Mexico State Library is up 24 hours a day, as are the systems run by the MINITEX network in Minnesota and the State Library of Iowa.

Transferring requests in files makes more work for the sysop

If you post requests as messages, the lending library could delete the requests by erasing the messages that contain them. But if you transfer requests in files, the files will remain on the board until the sysop erases them, since callers can't erase files and can download only copies of them. You'll have to set up a maintenance schedule that gives callers a reasonable chance to get their files but that doesn't give you a lot of headaches.

It's easiest to delete files once they've reached a certain age. For example, every day you could erase files that have been on the board for a week. To help prevent hassles, it's best to back up the files before you erase them. At WILS, we move old files to another part of the hard disk to get them out of the active file area but still keep them around in case a caller says they missed a file. Every month the old files get erased.

If you wanted to do more work, you could check the callers log every day and erase files once their intended recipients picked them up. Even though they've been picked up, it's a good idea to keep backups of the files in another section of the disk for awhile.

What format should the requests be in?

Design a request format before you set up the board

Whether you send requests as files or messages, *decide on a format before you set up the board.* Make sure this format will work well no matter what software is used to create it and no matter how the requests are printed out.

It's easiest if everyone can use the same program to type requests

If you're in charge of a small group of libraries who all have the same equipment, you can require them to use the same program to type their requests. For example, if you've all bought PC-File, everyone can type their requests using that program and transfer small database files. Or, you could use a program specifically for ILL. For example, members of the Delaware Co. Library System in Pennsylvania use PC-Loan to type requests they send to their electronic mail system. (For more information about PC-Loan, see the end of this report.)

Otherwise, set up a format any computer can produce easily

If you're stuck in a more realistic world, where everyone has different equipment and different tastes, establish a request format that will be easy to produce with any program on any computer. Don't force your callers to type more than neces-

sary or they'll try to find ways around using the proper organization. *Make sure everyone understands how to create a file in ASCII format*, since not every word processor automatically saves files as plain text. And, even though everyone has different equipment, try to offer a program, word processing template, or database template for that equipment that will make it easy to create standardized requests.

So,

If at all possible, have all your callers use the same program and the same request format. If this isn't possible because of differing equipment or politics, try to make using the right format as easy as you can or you'll be faced with complete anarchy. Without a standard design, you and your callers will receive creatively-arranged requests that make no sense, assuming the request files are in a format your computer can read at all.

A standard request format makes it easier to manipulate requests

A standard request format is particularly important if you want to take advantage of having requests in electronic form. If you process a lot of requests and you receive most of them electronically, it makes sense to try to put them in a database or somehow organize them. But this will be extremely difficult if the requests come in a jumble of styles.

Finally, a standard format can make it easier to print requests. If every request takes up the same amount of space or ends with the same word, it will be easier to automate their printing so each request fits on its own page. At WILS, we use paper that's perforated every 5 1/2 inches. When we print requests that are in the right format, they end up one per page, so we don't have to cut apart all 300 requests we get daily.

One possible ILL system

Here's one approach to interlibrary loan you might consider using. The system incorporates automated record-keeping and quick transmission to speed up ILL. It requires all libraries to have compatible equipment.

Give everyone the same textual database program and empty request databases

Buy a copy of the same database manager for every library. Preferably, this would be a program that can handle variable-length textual information well (such as AskSAM). Unfortunately, these programs are expensive, so you might end up with a regular database instead.

Design a template (empty database structure) for requests, creating a field for each request element you need. Give all the libraries a copy of the template. Each request would have a "TO:" field or something similar to identify the target library,

plus a field to record the request's status. The libraries could copy the template as they wish, probably creating two local databases, for incoming and outgoing requests. As a result, all the databases in all the libraries would have the same structure but would contain only local information.

In this ideal situation, ILL works like this:

Callers maintain two databases, for incoming and outgoing requests

Each librarian maintains two databases: one for requests she sends out, and one for requests she's received.

They create mini-databases of requests to send on the board

She uses the database program and template to type her requests into the outgoing database. When she's done typing requests for the day, she selects out the requests for each lender, putting copies of the requests into separate files, one file per lender. Now she has the requests in her database and has also created a mini-database for each lender.

Lenders incorporate requests they receive into their incoming databases

She calls the bulletin board system and sends the request files she created. She downloads the files posted for her library and, once she's off the BBS, incorporates them into her local "incoming" database.

The databases make sophisticated statistical reports possible

She uses the database's features to sort through requests, checking for ones that have been languishing too long and clearing out filled ones. She can generate statistics on either database at any time, finding out how many requests she's sending and receiving, and evaluating what kinds of materials she's borrowing and lending.

It's easy to refer a request to another lender

If a lender can't fill one of the requests the librarian has sent out, she can return to her outgoing database and send the same record to a different lender without having to retype all the bibliographic information.

This type of approach ensures that all libraries can quickly understand and use the request files they receive. Everyone can generate statistics tailor-made to their library from a database that's compatible with databases across the system. Staff supporting the system need to understand only the one database program, and librarians can call each other for help, as well. Everyone benefits from a centralized, standardized approach that makes file sharing easy.

This approach is very useful for ILL clearing-houses--they can maintain large databases of requests

The database-oriented approach is particularly useful for ILL clearinghouses—organizations that receive large numbers of requests and dole them out to likely lenders. If you're a clearinghouse, your members can send you mini-databases of requests, which you can easily incorporate into your own huge database for processing.

Using a BBS to transfer other types of information

A BBS is good for writing by committee

You can use a BBS to transfer information that isn't necessarily as structured as ILL requests. For example, you can use the system to route around drafts of a grant proposal or report. If several librarians are working on the report, each doing his or her own section, they could upload their work to the board. The person in charge of the final document could combine these files and post the result, which everyone could download, add comments to, and upload again.

This approach to writing by committee avoids the redundant typing that's usually involved—rather than sending a paper version to the central office, which then has to retype what someone else has already typed, authors send work that can be quickly and easily edited.

While you could do this kind of work on an electronic mail system, you could run into the same problem described earlier: you might have to send your work as a message, which the recipient will have to view and laboriously capture, line by line. If the E-mail system lets you send files, it might not be able to use any of the file transfer protocols that protect against line noise, so your files might become infested with garbage characters.

Other information that could be transferred as files on a BBS include search results from CD-ROM or online databases, information on continuing education classes or workshops that's too lengthy to put in a bulletin, graphics files, programs of any type, and databases that list each library's holdings and that can be combined into one large database at each library.

Bulletin boards for the public

Quite a bit has been written about setting up bulletin boards for patrons. If you want to do this, you can get the best ideas and help from sysops of other public boards in your area and from the publications listed at the back of this report. Of the 38 library bulletin boards in the ASIS report mentioned earlier, 13 were intended for use by patrons to some degree.

Library-based bulletin boards can be used for:

announcements of library activities
any public debate (censorship, local politics, etc.)
book reviews

movie ratings
reference requests
educational programs, trivia games, and other public domain files not already widely available online
indexes of microcomputer journals

Attract professionals to your board with current information about microcomputers

The last application was suggested by several callers to Madison-area boards when they were considering encouraging the public library to set up a BBS. It can be very hard to track down individual product reviews or important news in microcomputer magazines, and the callers were trying to maintain their own indexes and were getting overwhelmed.

Several callers suggested that regular readers of such publications upload a brief index of each issue for inclusion in an online database. Each volunteer would be in charge of only one publication. Ideally, a text retrieval program like AskSAM or Word Cruncher would be available through a window on the board, so callers could immediately update or search the database.

The same Madison-area callers who were interested in maintaining an online journal index were also eager to have an online listing of all the files available on all local bulletin boards. That way a caller looking for a particular file wouldn't have to call every board in town—he could call the library and find out which system had the file. The information would be contributed by each board's sysop on a regular basis.

Spokane Public Library posts reviews of new computer books on their system and lists computer group meetings and workshops. Some other library boards are used by area computer user groups for member support.

These kinds of services help establish a board as one for professionals as well as for the general public. If you offer nothing that will regularly draw adult microcomputer owners, you might find yourself overwhelmed with teenagers fond of pranks and obscenities. Since professionals who use computers always need more information about them, any online service that offers current computer information will be popular.

Make yourself visible on area bulletin boards to attract callers to yours

If you plan to set up a public bulletin board, make sure you're familiar with the reputable boards in town. Leave public messages on them asking for suggestions for your board and answer the replies you get. If you make yourself visible and establish yourself as a member of the BBS community before you set up your own system, you'll find that a lot of helpful, responsible people will follow you to your board. You might even find yourself with an experienced volunteer sysop and several free consultants to help you get going.

Don't rely on volunteers to run the board

However, *don't rely on volunteers*—make sure you can run your board yourself. And avoid volunteer sysops who aren't established professionals—teenage or quirky sysops can ruin your system.

No matter what kind of board you set up,

talk to your future callers. If you're planning a system to be used by a group of libraries, make sure those libraries know what's going on and have a say about how the BBS will be used. If you're setting up a board for your patrons, make sure their representatives understand and approve of what you're trying to do and feel free to make suggestions.

Setting up the system

Here's a suggested plan for narrowing your options down to one program and installing the system.

1. Call existing bulletin boards

Before you buy anything, call several bulletin boards that are already operating. Call systems set up by other libraries and ones run by user groups or hobbyists in your area. Try to call boards that use different BBS software so you see how different programs interact with callers.

Don't try to set up your own board without calling lots of established systems first

Don't take one step toward setting up your own system without calling some existing boards first. If you don't have any first-hand experience with bulletin board systems, you won't be able to reliably pick the best software for your needs and you won't understand how the different features really work.

If you don't know of any bulletin boards to call, contact a local computer store, user group, or university computer department. You probably need to find only one phone number: most public bulletin boards have long listings of other systems in the area and across the nation. Also, *Computer Shopper*, an oversized, very thick publication consisting mostly of ads, often lists BBS numbers.

For numbers of library bulletin boards, see the ASIS publication included in the bibliography. It lists the phone numbers of several library boards open to the public. Some of these numbers are also included in the "Programs" section of this report. Remember that any list of BBS phone numbers could be out of date even before it's published, so be prepared for wrong numbers.

Leave messages asking for sysops' opinions

As you call more systems and begin to narrow down your options, leave a brief message for the system operator asking him what he thinks of his program. Summarize what you plan to do and ask him if he thinks the program he uses will work well for that. Most system operators are eager to talk about their boards, although they might not be able to explain everything in language that makes sense to you.

Leave a public question to spur discussion about BBS software

Another way to get information about bulletin boards from experienced sysops is to leave a public message on a computer user group BBS. Briefly describe what you plan to do and ask for opinions about the best BBS software for the job. This will set off what might appear to be all-out war as area sysops defend their programs and violently attack other systems. Collect all the pertinent messages to disk and sort through them offline to help you get an idea of which program seems to be the easiest to maintain and best-suited for your use.

If you're not particular about what kind of computer the board should run on, make sure you call systems based on Apples, Macs, and IBMs to compare their features and flexibility.

Review the section of the report that describes BBS program features to make sure the program you're interested in will do what you want.

2. Figure out what hardware you'll need

Be careful if you want to buy "compatible" hardware

When you've decided on a program, get the necessary hardware to run it. While you can certainly save money by getting a clone if your board requires an MS-DOS system, be careful. When you shop for hardware, make very sure the system is 100% compatible with the more expensive hardware it's supposed to imitate. This is especially important with modems, since not every "Hayes-compatible" modem is compatible at a level required by bulletin board software. If you're in doubt, call the company that produced the bulletin board software.

3. Find a system operator

Find someone on your staff who's willing to be the sysop and take charge of the board's setup and general well-being. Ideally, this is the same person as the one doing all the calling and shopping described in the first two steps.

The sysop will need to have some advanced knowledge of the computer

The sysop will need some rather advanced knowledge of the computer the board will be based on. For example, IBM PC bulletin board programs often require advanced knowledge of DOS, including lots of experience writing batch files, using modems, and creating CONFIG.SYS files.

The sysop will also need a lot of time, especially at the beginning. It can take days to get a bulletin board system working, and then take several more days to fine-tune it. It's

best if only the sysop spends long hours puzzling through the manual and figuring out how the system works. She can then summarize the possible configurations so several staff members can decide what features to use. Make sure the sysop is familiar with the procedures the board is replacing or joining.

Don't let someone else set up your board and disppear

Don't have a consultant set up your board and then disappear without training you thoroughly. If you hire a consultant or someone else who's not going to stick around, make very sure you'll be able to not only maintain the board but set up a new version without his help. You need to be intimately familiar with your system to be able to troubleshoot it.

4. Find a backup system operator

Find a backup system operator and maintenance staff

Once the sysop has the board set up, she should teach others how to troubleshoot and maintain it. Since troubleshooting the board probably also requires advanced knowledge of the operating system and communications protocols, it would be easiest if the backup sysop already knew quite a bit about the computer running the BBS.

The backup sysop's job is to handle BBS problems when the main sysop is away or busy. He could also be in charge of the daily maintenance—checking the messages and callers log and answering routine questions. Some libraries assign this to other staff, so three or four people work with the board at some level.

5. Configure the board for your callers

Work with the sysop to decide which features of the system you should use, what the menus should look like, and what the help screens should say. *Keep your callers in mind through all of this.*

If all your callers will be familiar with microcomputers, you can probably go ahead and use all the nifty features you want. If you expect a mixture of callers, be sure to provide a simple menu and help screens for the timid while at the same time you make available more powerful commands for the gung-ho. Sometimes you can do this by providing two menus, one that lists the basics and another that abbreviates the basics and includes the power commands. Many systems offer separate menus that shuttle some of the advanced commands off to a "utilities" section.

If your callers will be inexperienced, make the board as simple as possible

If most of your callers will be first-time computer users, keep your menus simple and use only the essential commands. For example, if your BBS program offers three different ways

to scan through messages, pick the command that seems to have the best all-around use and de-activate the other two.

No matter what level of experience you expect from your callers, keep your system simple. Don't send callers through a maze of passwords unless tight security is really essential. Don't make them go from conference to conference when it would be more convenient to have all the messages together. Try to use self-explanatory but brief menus that callers can hide when they're confident.

Be direct and concise in menus and help screens

In your menus and help screens, be extremely direct and concise. This will make your explanations easier to understand and less time-consuming to read. For example, use phrases like "hit RETURN" instead of "depress the ENTER key." Avoid cryptic abbreviations like "C/R"—at least a third of our early callers laboriously typed "C/R" when they were confronted with a standard RBBS-PC prompt that refers to the "carriage return" key. When you refer to file transfer, always explain "upload" (send) and "download" (receive), which many people get confused.

Document what you've done

Document and back up everything you do. Write down your reasons for using some commands and de-activating others, print out your batch files and CONFIG.SYS and add notes to them, and do whatever else you need to do to keep track of what you've done. You'll need this information when you troubleshoot the system.

6. Test the board internally

When the board seems to be working, call it from another computer. Abuse the system as much as you can and try to see where callers might get confused. Try to protect against any mistakes that will increase the time that callers spend online and that you spend maintaining the board.

Have an inexperienced computer user call the board for the ultimate test

For the best test, have a staff member who's never called a bulletin board try to send a file to yours. Watch her to see where she gets stumped and modify the board accordingly.

7. Consider writing a manual

The internal test might convince you that you need a manual or at least a short guide for your callers.

If you write a manual, keep it short

Often the shortest manual is the one that gets read, so try to cover everything in sufficient but not mind-numbing detail. Avoid simply listing keystrokes without mentioning what they do.

Don't simply list keystrokes--explain what they do

Some of the callers to the WILS board get into trouble because they're entering meaningless keystrokes and not paying attention to what the board is asking. If you present the call as a discussion with the board, it will encourage callers to look at the system prompts and think about what they're saying. For example, they'll recognize the prompt "File to retrieve" as the board's way of saying "What file do you want me to get?" so they won't try to enter commands that apply only to messages.

Include a summary of commands

In your manual, use the same direct language as you used in the help screens and menus, and refer to your reader as "you," not "the user." Show a sample call and *include a cheat sheet* or some other summary of commands.

8. Test the board with a few callers

Look over your potential callers and find a handful who can communicate well. Try to include a variety of skill levels in your test group.

Watch the test calls

Watch the calls to see which procedures seem to be confusing. Don't wait for the testers to call you with suggestions—call them to ask them for ideas.

9. Revise everything

Revise whatever needs changing, based on your test callers' suggestions and problems. At WILS, we changed the wording in the menus, corrected the manual, and got rid of a redundant feature.

10. Write it all down and back it all up

Keep detailed records

Keep detailed and current records of the board's configuration, the contents of any batch files, the daily maintenance procedures, problems and their solutions, and anything else you might need to refer to.

Write manuals for your own staff. Most importantly, have a step-by-step guide to daily maintenance procedures. If the sysop has the time, she should also write a sysop's manual, so a new system operator will be able to learn about the board quickly. You might also want to compile a separate troubleshooting guide as you run into problems.

At WILS, we keep the most important information next to the BBS:

a four-page guide to maintaining the board
the RBBS-PC manual (such as it is)
our own manual for the sysop
printouts of the current configuration settings
a troubleshooting guide
a printout of the current users file

We have a lot of detailed batch files, and I very easily forget exactly what goes on in them. I keep a printout of batch files handy so I don't look completely blank when someone maintaining the board has a question.

Of course, back everything up thoroughly. Besides backing up the hard disk, we keep a working copy of the board on floppies so we can still keep it going if the hard disk dies.

11. Open up the board and monitor it

Keep a close eye on the system the first few weeks it's up. Watch callers while they're online and look for common misunderstandings and mistakes. Review the callers log to see if anyone seems to be running into trouble.

Use the statistics program to get an idea of use

If your BBS software has a statistics program, use it. Do what you can to find out how much use the system is getting and how callers are handling it. If you see a sudden increase in time on the board or in aborted file transfers, keep an eye on callers to see if someone's having difficulties.

Your board's future

Once you have a program, the necessary hardware, a sysop, and eager callers, your board should take off with only a little nurturing. Systems established with a clear goal and definite need to fill usually have no trouble surviving.

But if you're setting up a general-purpose board just to see how it works, you might have to do a little work to attract regular callers. Such boards are definitely in trouble if their potential callers don't have easy access to a computer with a modem. If you have any control over the hardware used by your potential callers, make sure they all have a computer and modem handy. Otherwise, your system will get several curious tourists but no permanent residents.

Once your board is getting along well, don't simply relax and ignore it. Keep an eye on microcomputer literature for enhancements to your program or for new systems that might work better. You might run across an update or new program that would give you enough new features to make its installation worthwhile.

Also, keep an eye out for other library sysops and stay in touch with public bulletin boards in your area. That way you'll keep up with changes in communications technology and will continue to maintain your visibility as a library sysop. Budding sysops will know they can talk to you, and helping them along will give you ideas for your own board.

The free and informal flow of information made possible by bulletin boards makes them a natural addition to any library's services. By setting up your own system, you join a growing number of librarians who are realizing yet another advantage offered by well-planned automation.

BBS programs

Information about several of these programs is from *Bulletin Board Systems*, June/July, 1987. See that issue's directory on pp. 1-13 for more information, including lists of programs for other microcomputers. The "data" phone number in many listings will connect you with a sample bulletin board run with that software.

Some program listings here include information about library bulletin boards using that software. If you want to call some of the boards, try calling the BBS number from a regular phone first, so you can talk if you accidentally get a human. Most of the information about library boards included here is from the ASIS paper, which is riddled with typos and should be used with caution (see full citation in "Suggested reading").

This section is not intended to help you make a final decision about what software to use. I've included it only to give you an idea of what's available and whom to contact.

IBM PC and compatibles

BBS-PC

Micro Systems Software, Inc.
12798 W. Forest Hill Blvd. #220
West Palm Beach, FL 33414
305-790-0772 voice
800-327-8724 voice
305-790-0774 data
$99.95

Supports up to 16 message sections, 4 access levels.

dBBS

DannySoft, Inc.
166 East 96th St.
Suite 15B
New York, NY 10028
$175

The Middlesex Regional Library Cooperative in Piscataway, New Jersey runs a dBBS board for interlibrary loan. Sysop is Ann Marie LeMal at LINX Union Middlesex Regional Library Cooperative, 44 Stelton Road, Piscataway, NJ 08854; 201-390-6735.

DLX

Inner Loop Software
5456 McConnell Ave., Suite 120
Los Angeles, CA 90066
213-822-2800 voice
213-822-9390 data
$200

Can support up to 9 lines plus a user at the keyboard. Supports 10 security levels, electronic mail, online conferencing, XMODEM, 2400 baud.

Fido BBS

Fidonet Administration
Box 41143
St. Louis, MO 63141
618-251-2169 data
free or $60 or $175 (reports vary)

I find this system confusing for callers, but others like it. Fido boards can be linked into the national FidoNet and share messages. For a description, see the "Bulletin Board Systems" column in the Dec. 1987 *Small Computers in Libraries*, p. 52. OPUS software is compatible with Fido.

The Louisville Free Public Library runs a Fido board at 502-584- 4162. Sysop is Timothy Hellner

at the library, 301 W. York St., Louisville, KY 40203; 502-561-8658.

The Univ. of Minnesota Libraries runs a Fido board at 612-624- 4318. Sysop is Audrey Grosch, Univ. of Minnesota Libraries S-98 Wilson, 309 19th Ave. South, Minneapolis, MN 55455; 612-624-7038.

FoReM

Commnet Systems
24 Randy Rd.
Framingham, MA 01701
617-626-1388 voice
617-620-0903 data
$59.95

Supports online graphics and five transfer protocols, including Ymodem and Kermit. Handles up to 64 conference areas and 400 "download categories."

Galacticomm BBS

Galacticomm Inc.
11360 Tara Drive
Plantation, FL 33325
305-472-9560 voice
305-922-3901 data (days)
$4,486-7,450

Works with special modem card to support up to 16 channels. Offers online group chats, conferences, order entry, and database searching. For a description of what appears to be the same program, see the "Bulletin Board Systems" column in the Oct. 1987 *Small Computers in Libraries*, pp. 44-45.

Infohost

A-Comm Electronics Inc.
377 Route 17 S.
Hasbrouck Heights, NJ 07604
201-288-7885 voice
201-288-7792 data
$495-1,495

Supports up to 8 lines. Includes full relational database manager and editor. Supports "parts ordering."

MCD

FYI, Inc.
4202 Spicewood Springs Rd.
Suite 204
Austin, TX 78759
512-346-0133 voice
512-346-0135 data
$295-1,695

Offers online access to full-text indexed databases with Boolean searching. Uploaded files (binary or text) are attached to messages, not sent from a separate menu. "Automatic self-maintenance," 4 levels of menu help; supports up to 8 phone lines and conferencing.

The Texas State Law Library makes their card catalog available online with MCD at 512-463-1371. Sysop is Kay Schlueter at Texas State Law Library, Box 12367, Austin, TX 78711-2367; 512-463- 1722.

The Buffalo Museum of Science uses MCD to provide online botanical databases at 716-896-7581. Sysops are Richard Zander and Patricia Eckel at Clinton Herbarium, Buffalo Museum of Science, Humboldt Parkway, Buffalo, NY 14211; 716-896-5200.

Nochange BBS

Nochange Software
540 Silver Pine Trail
Roswell, GA 30076
404-587-3815 voice
404-641-8270 data
$89.95

Supports online graphics, personal file areas; unlimited message base size.

OPUS

Wynn Wagner III
Private Oak Lawn Exchange BBS
Dallas TX
214-991-3381 data
free (public domain)

"A powerful BBS program with a strong electronic mail" component (*Bulletin Board Systems*, June/July 1987). Compatible with Fido. Supports international mail transfers and seven file transfer protocols.

The Mountain Valley Library System in Sacramento runs an OPUS board for regional libraries.

Sysop is Mark Parker, Mountain Valley Library System, 828 I St., 3rd Floor, Sacramento, CA 95814; 916-444-0926.

PC Board

Clark Development Co., Inc.
P.O. Box 71365
Murray, UT 84107
801-261-1686 voice
801-261-8974 data
505-821-7379 data
$79.95-999.95

Full-featured system that can support up to 39 nodes. Higher-priced versions support doors.

The Federal Library and Information Center Committee at the Library of Congress runs a PC Board system from 7:30 a.m.-5 p.m. ET at 202-287-9656. Sysop is Bruce Miller, Federal Library and Information Center Committee, c/o Library of Congress, Adams 1026B, Washington, DC 20540; 202-287-1374.

PC Host

Shamrock Associates Inc.
545 South Main St.
West Hartford, CT 06110
203-561-2000 voice
301-949-8848 data
$92.50

Designed as an online order-taking program, this could possibly be used for ILL or reference requests. Supports Kermit, XMODEM, and YMODEM file transfers.

RamNet

System Design Associates
594 Third Ave.
New York, NY 10016
212-889-6431 voice
212-889-6438 data
$149

Runs in the background, letting you use your computer for other work.

RBBS-PC

Capitol PC Software Exchange
P.O. Box 6128
Silver Spring, MD 20906
203-268-9656 voice
415-689-2090 data
$16

Although several libraries use this program, it's not necessarily the one for you. It's rather awkward to set up and maintain, has a manual written for hackers, and has rather shaky support. If you want to have multiple nodes, you have to run multiple copies of the software. It still has a few bugs and is updated frequently. Language used in the prompts can be confusing.

On the plus side, all menus and help screens and the welcome screen are text files you set up. You can control the security level assigned to individual commands. The system offers expert and novice modes. Source code (in QuickBASIC) is included.

To get the program, send $8 to the above address, asking for the current version of RBBS-PC. Allow three to four weeks for delivery (it's an all-volunteer organization). It's also available from PC-SIG and other companies that distribute public domain programs and shareware.

Here's a sampling of RBBS-PC boards run by libraries:

The West Virginia College of Graduate Studies runs an RBBS-PC board for students and faculty. Sysop is Rebecca Bills, West Virginia College of Graduate Studies, WVCOGS Information Services, Institute, WV 25112; 304-768-9711 ext. 229.

Spokane Public Library runs an RBBS-PC system for patrons from 6 p.m.-8 a.m. weekdays, all day Saturday during the summer, and all day Sunday at 509-838-4726. Sysops are Patricia Bonner, Su Mallery, and Jeff Benefield at Spokane Public Library, W 906 Main, Spokane, WA 99201; 509-838-3361.

New Mexico State Library runs an RBBS-PC board for ILL and other communications. Sysop is Harold Bogart, New Mexico State Library, 325 Don Gaspar, Santa Fe, NM 87503; 505-827-3817.

The Jackson/Hinds Library System runs an RBBS-PC system for branch libraries that supports ILL and other communications. Sysop is Tom Ballard, Jackson/Hinds Library System, 300 N.

State St., Jackson, MS 39201; 601-968-5817.

Several Wisconsin public library systems run RBBS-PC boards for ILL. For information on the versions they use, contact Paul Jakoubek, Dept. of Public Instruction, Division for Library Services, Reference and Loan Library, 2109 S. Stoughton Road., Madison, WI; 608-221-6166.

TBBS (The Bread Board System)

Esoft Inc.
4100 S. Parker Road #305
Aurora, CO 80014
303-699-6565 voice
303-699-8222 data
$300-386

Allows unlimited menus; available in single- or multi-user versions (up to 8 simultaneous callers). Marketed primarily at corporate users. "A very friendly system which supports a host of functions" (Patrick Dewey).

The Loma Linda Univ. Medical Center runs a private TBBS board for Medical Center employees. Sysop is Paul Kittle, Information Center, Loma Linda Univ. Medical Center, 11234 Anderson, Loma Linda, CA 92354; 714-824-4620.

The Norris Medical Library in the Univ. of Southern California also runs a TBBS system. For a description, see "The Norris Medical Library Bulletin Board" by Elizabeth Wood in the May 1988 issue of *Small Computers in Libraries*, pp. 30-34.

T-COMM

The CommSoft Group
POB 3652
Gaithersburg, MD 20878
301-428-7931
$59-149

Multi-user version for local area networks available.

TEAMate

MMB Development Corp.
753 Deep Valley Dr.
Rolling Hills Estates, CA 90274
213-545-4504
$495-$2,495

Uses the Xenix operating system to support multi-user access to a textual database. Separate modules for conferencing, electronic mail, and other operations.

Apple II series

ABBS

Software Sorcery, Inc.
7927 Jones Branch Dr.
Suite 400
McLean, VA 22102
$174.95 (1986)

For Apple II+.

Montgomery Co. Public Schools in Rockville, Maryland runs an ABBS board for school librarians from 8:30 am.-5 p.m. ET at 301-762-0879. Sysop is Ellen Pruitt, Dept. of Instructional Resources, Montgomery Co. Public Schools, 850 Hungerford Dr., Rockville, MD 20850; 301-279-3494.

A-C-C-E-S-S

Information Intelligence, Inc.
Box 31098
Phoenix, AZ 85046
800-228-9982 voice
602-996-2283 data (evenings & weekends)
$250

Offers 80-column messages, five security levels, electronic mail, forms for orders, and automatic forwarding and retrieval of messages.

Electronic Messaging System

SnAPP Systems
1588-1 Batavia St.
Orange, CA 92667
714-532-6800 voice
714-779-7205 data
$54.95

For Apple II, II+, IIe. A IIc version can be special ordered. Stores up to 1,500 messages in up to 15 sections. Supports up to 99 text files.

GBBS (General Bulletin Board System)

L&L Productions
P.O. Box 5354
Arvada, CO 80005
$125

Several libraries use GBBS to run systems for their patrons.

Odessa College in Texas runs a GBBS board at 915-335-6660. Sysop is David Carson, Odessa College Media Dept., 201 W. University, Odessa, TX 79764; 915-335-6647.

San Bernardino Public Library runs a GBBS Pro board at 714-884- 4922. Sysop is Shawn Russel, San Bernardino Public Library, 555 W. 6th, San Bernardino, CA 92410; 714-381-8237.

The Suburban Library System in Maywood, Illinois, runs a GBBS Pro system at 312-343-0100. Sysop is Patrick Dewey, Suburban Library System, Maywood Public Library, 121 S. Fifth Ave., Maywood, IL 60153; 312-343-1847.

Micro-Com BBS

Micro-Communication Software
Box 320028
Tampa, FL 33679
813-251-6785
$99.95

Sold with add-on modules for games, ads, product lists.

Networks II

High Technology Software Products
POB 60406
Oklahoma City, OK 73146
405-848-0480
$99

For Apple II+ or IIe. Offers public boards, private E-mail. Supports up to 8 "subject areas."

Protree Elite

Micro Data Products
5739 South Olanthe Court
Aurora, CO 80011
303-360-6200 voice
303-680-9292 data
$249

Designed for Apple network. Supports special interest groups, online conferences, multi-player games.

T-Net

Sentral Research and Development, Inc.
14240 Melva Dr.
Warren, MI 48093
313-775-5333 voice
313-775-1649 data
$100

Includes source code. For Apple II, II+, IIc, IIe, IIgs.

TProBBS

Design Computers Inc.
11900 Wayzata Blvd.
Minneapolis, MN 55343
612-545-2776 voice
612-545-7357 data
$79.95

Offers survey features, full-text editor; supports XMODEM.

Macintosh

HyperBBS

available through Apple Library Users Group,
10381 Bandley Dr. M/S 8C Cupertino, CA 95014
408-973-2552 or 2400
public domain

HyperCard required; hard disk recommended. "Very easy to use." Supports public & private mail, file transfer. Callers can select messages by date, author, or key word. Help screens are "quite extensive." Review in the April 1988 *Apple Library Users Group Newsletter*, pp. 37-39.

Mouse Exchange

Dreams of the Phoenix Inc.
Box 10273 Jacksonville, FL 32247
904-396-6952 voice
803-548-0900 data
$49.95

Public news sections, 10 security levels, supports XMODEM.

Red Ryder Host

The Freesoft Co.
10828 Lacklink
St. Louis, MO 63114
314-423-2190
$60

Somewhat limited but popular; supports XMODEM and includes a module for surveys or product ordering.

Microcomputer-based electronic mail programs

IBM PC and compatibles

Caucus

Metasystems Design Group
2000 N. 15th St. Suite 103
Arlington, VA 22201
703-243-6622 voice
703-243-9696 data (login "dcmeta")
$700

Multi-user conferencing system; can support 4-16 users on an AT running Xenix. Other configurations for other machines and operating systems available.

Chairman

Dynamic Microprocessor Associates
545 Fifth Ave. Suite
1103 New York, NY 10017
212-687-7115 voice
516-462-6639 data (log on with first name "DMA", last name "Guest", password "Chairman")
$995

Supports 6 simultaneous users on a PC with a special serial board. Supports database searching, E-mail, conferencing. Singe-user version available for $295.

The Delaware Co. Library System uses Chairman for interlibrary loan and electronic mail. Sysop is David Belanger, Delaware Co. Library System, Government Center Building, Media, PA 19063; 215- 891-5190.

The PALINET network in Philadelphia runs Chairman for network members. Sysop is Dennis Gormley, PALINET, 3401 Market St., Suite 262, Philadelphia, PA 19104; 215-382-7031.

The Greater Philadelphia Law Librarian's Association runs a Chairman system at 215-627-0224. Sysop is Jean Willis, Greater Philadelphia Law Librarian's Assn., P.O. Box 335, Philadelphia, PA 19105; 215-299-2140.

The Iowa State Library uses Chairman for ILL. For more information, contact Shirley George, State Librarian of Iowa, Iowa State Library, Historical Building, Des Moines, IA 50319; 515-281-4113 or Gerry Rowland, Networking Consultant, Office of Library Development, State Library of Iowa, Historical Building, Des Moines, IA 50319; 515-281-4499.

Programs that create ILL requests for transmission

F.I.L.L.S.

MacNeal Hospital
Health Science Resource Center
3249 S. Oak Park Ave.
Berwyn, IL 60402
800-323-9215
$360-495

Used to input ILL requests on IBM PCs and print them on ALA forms. Compiles many statistical reports. Can handle up to 2,000 outstanding loans on the XT and AT versions. Supports Epson-compatible printers only. Can also produce request files for transmission as messages on OnTyme electronic mail system. The programmer thought these files could also be sent to bulletin boards, although extra characters would appear between requests.

PC-Loan

WILS
Room 464
728 State St.
Madison, WI 53706
608-262-0047
$30

An easy-to-use IBM PC program that creates plain text files of requests in four formats. You can print, edit, and transmit the files. Program displays blank form for monograph or serial requests; you fill them in using full-screen editing. Also supports free-form messages. Automatically numbers requests and keeps track of the numbering systems used by as many different lenders as you can fit on a disk. Communications program not included. Files can be sent to any bulletin board or electronic mail system.

Glossary

with some tips for grant writers and others who have to explain bulletin boards

batch files. Lists of DOS commands saved as executable files. When you run a batch file, the DOS commands you've included in it run automatically. You can create batch files with any text editor. AUTOEXEC.BAT is a batch file that runs automatically when you start your computer. You can run it and any other batch file by entering the name of the file like you'd enter a command.

BBS. Short for "bulletin board system." "BBS system" is redundant (it means "bulletin board system system"). Some people write the plural as BBS's and others as BBS.

bulletin. On most systems, a sort of log-on message from the sysop that contains important announcements for all callers. Many boards let you make the main bulletin optional so callers can skip it. "Bulletin" also refers to optional files, often listed in the main bulletin, that callers display online.

callers log. A list of who's called the board. Usually records files sent and other actions; often available online, to the sysop at least.

comment. A private message automatically addressed to the system operator.

conference. On a bulletin board system, a subset of messages often set apart for certain callers or grouped around a specific topic.

CONFIG.SYS. On IBM microcomputers, an optional file that helps determine how the computer works. CONFIG.SYS contains special commands that run when you start the computer and control such features as memory allocation and time and date format.

download. Get a file from a bulletin board.

EBBS. Short for "electronic bulletin board system," another way of referring to bulletin board systems in general.

message. A private or public note entered by a caller, usually typed online.

multitasking. Running two programs at once by dividing the computer's memory. A multitasking program can divide your computer's RAM in two, running the BBS and letting you use the computer for other work at the same time.

PC Board. A commercial BBS program. *Not* a generic term that refers to any bulletin board system.

protocol. When it's applied to transferring files, it refers to how the sending and receiving computers transfer the data. When computers use an "error-checking protocol" (like XMODEM), the receiving computer usually echoes what it's received, so the sending computer can tell if the data got through all right. When computers use "ASCII protocol," which applies to text files only, the sending computer simply tosses the data to the receiving computer. Noise on the phone lines can interfere and add garbage characters to the file.

RAM. Random Access Memory—the computer's volatile memory. Everything in RAM is lost when you turn off or reboot the computer.

RBBS. Short for "remote bulletin board system," another way of referring to a generic BBS.

RBBS-PC. A bulletin board program published by the Capitol PC Users Group in Washington, DC. *Not* a generic term that refers to any bulletin board program.

SIG. Special Interest Group. Some BBS programmers use "SIG" to refer to conferences or other subdivisions of the board. SIGs are usually subgroups of a microcomputer user group.

source code. The original commands that make up a program. When you have the source code, you can change the program. You can't run source code without using another program to interpret it, so the code is usually compiled (and made hard to modify) to make the final executable program. For example, if you have the source

code of a BASIC program, you can change it, using a BASIC interpreter. When you're done, you can create a stand-alone program by compiling the source code using a BASIC compiler.

sysop. Short for "system operator." The person who oversees the bulletin board and has ultimate control over it. Pronounced "SISSop," not "SIGHsop."

turnkey. A "turnkey system" is one that comes already installed—all you have to do is turn it on. A turnkey bulletin board supposedly requires no installation or configuration work.

upload. Send a file to a bulletin board.

Suggested reading

American Society for Information Science, Special Interest Group on Personal Computers. "Directory of Electronic Bulletin Board Systems in Libraries and Related Organizations." Audrey N. Grosch, ed. Available in the file called BBSLIST.ARC from the Univ. of Minnesota Libraries BBS at 612-624-4318 or from Audrey Grosch, Univ. of Minnesota Libraries, S-98 Wilson Library, 309 19th Ave. South, Minneapolis, MN 55455. *Lists and briefly describes 38 library-run bulletin boards. Useful information but lots of typos and misspellings.*

Belanger, David. "The Electronic Mail System of the Delaware County Library System." *Small Computers in Libraries*, Jan. 1988, pp. 24-27. *Describes how the county used RBBS-PC to send ILL requests as messages. They've since switched to a more sophisticated PC-based electronic mail system using Chairman.*

Bills, Rebecca. "Setting Up an Electronic Bulletin Board." *Small Computers in Libraries*, July/Aug. 1986, pp. 28-29.

Burke, Barbara and Linda McNamara. "Electronic Bulletin Boards: an Annotated Bibliography, Part 1." *Small Computers in Libraries*, June 1985, p. 17.

Burke, Barbara and Linda McNamara. "Electronic Bulletin Boards: an Annotated Bibliography, Part 2." *Small Computers in Libraries*, July/Aug. 1985, p. 20.

Burke, Barbara and Linda McNamara. "Electronic Bulletin Boards: an Annotated Bibliography, Part 3." *Small Computers in Libraries*, Sept. 1985, pp. 16-20.

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Burke, Barbara and Linda McNamara. "Electronic Bulletin Boards: an Annotated Bibliography, Part 5." *Small Computers in Libraries*, Nov. 1985, pp. 17-19.

Burke, Barbara and Linda McNamara. "Electronic Bulletin Boards: an Annotated Bibliography, Part 6." *Small Computers in Libraries*, Dec. 1985, pp. 11-14.

Cane, Mike. *Computer Phone Book.* Plume: NAL, annual, $9.95.

Ciarcia, S. "Turnkey Bulletin-Board System." *Byte*, Dec. 1985, pp. 93-103.

Dewey, Patrick. "Electronic Bulletin Boards: Applications in Libraries." *Library Journal*, Nov. 1986, pp. 10-19 of the "Library Computing" supplement. *Presents results of a survey of library bulletin boards, describing several systems and discussing boards for patrons.*

Dewey, Patrick. *Essential Guide to Bulletin Boards.* Meckler Publishing, 1986, ISBN 0-88736-066-1, $24.95. *Describes and reviews software and offers suggestions for setting up and maintaining a BBS.*

Dewey, Patrick, et al. "Library Use of Electronic Bulletin Board Systems." *Library Software Review*, Nov./Dec. 1985, pp. 351-361.

Dewey, Patrick. "The Electronic Bulletin Board Arrives at the Public Library: The North-Pulaski Library Prototype." *Library Hi Tech*, Spring 1984, pp. 13-17.

Fersko-Weiss, H. "The Bulletin Board Connection." *Personal Computing*, Aug. 1986, p. 85.

Golfer, J. Larry. "Going On-Line with America: The World of Electronic Bulletin Boards, Part 1." *Small Computers in Libraries*, Feb. 1986, pp. 20-23.

Golfer, J. Larry. "Going On-Line with America: The World of Electronic Bulletin Boards, Part 2." *Small Computers in Libraries*, March 1986, pp. 13-15.

"How to Set Up a Company Bulletin Board." *Personal Computing*, March 1986, pp. 83-85. *More of a "why" than a "how-to" article.*

Levitan, Arlan R. "Electronic Bulletin Boards: A Retrospective." *Compute!*, July 1986, p. 105.

"Libraries Extend Their Reach with Bulletin Board Systems." *Bulletin Board Systems*, June 1985, p. 2.

Meyers, Larry. *How to Create Your Own Computer Bulletin Board*. TAB, 1983, $12.50.

Moore, Cathy. "A Bulletin Board for ILL." *Small Computers in Libraries*, May 1987, pp. 42-44. Also in the *Proceedings* of the 1987 Small Computers in Libraries Conference (Arlington, VA, March 30-April 1). *Describes the BBS used at Wisconsin Interlibrary Services.*

Moore, Cathy. "Do-It-Yourself Automation: Interloan Bulletin Boards." *Library Journal*, Nov. 1, 1987, pp. 66-68 ("Library Computing" supplement). *Describes BBS used at Wisconsin Interlibrary Services.*

Perez, Ernest. "The BBS Alternative: Filling a Company's E-Mail Needs Via PC-Run Software." *Link Up*, May 1987, pp. 12-13+.

Schack, Markham B. "Electronic Access: Put Your Library On-Line with a Computer Bulletin Board." *Small Computers in Libraries*, March 1987, pp. 16-19.

Wilburn, Gene and Marion Wilburn. "Microcomputer-Based Bulletin Board System: Free Videotext and Electronic Message Services" in *Microcomputers for Libraries: How Useful Are They?* ed. by Jane Beaumont and Donald Kuger. Canadian Library Assn., 1983.

Williams, Gene, and Chris Mitchell. "Setting Up a Library BBS: A Step-By-Step Guide." *Wilson Library Bulletin*, Feb. 1987, pp. 12-15, 79.

Wood, Elizabeth H. "The Norris Medical Library Bulletin Board." *Small Computers in Libraries*, May 1988, pp. 30-34. *Describes a system that uses TBBS software.*

Magazines and newsletters

Connect: Libraries and Telecommunications. A newsletter covering online networks, terminal software, and bulletin boards. Steve Cisler, 625 Barnacle Way, Suisun, CA 94585; $18/year.

Link-Up: Communications and the Small Computer (monthly) covers electronic mail, online databases, and bulletin boards. Learned Information, 143 Old Marlton Pike, Medford, NJ 08055; $23.95/year. ISSN 0739-988X.

Small Computers in Libraries has a column called "Bulletin Board Systems," edited by Patrick Dewey, that covers library and other boards (since Oct. 1987). Meckler Corporation, 11 Ferry Lane West, Westport, CT 06880; $45/year. ISSN 0275-6722.